BenQ M22
GSM / GPRS Wireless Module
AT Command List

AT Command
Rev. 0.3.0
Jun 2004

COPYRIGHT BENQ Corporation
This document contains proprietary technical information which is the property of BenQ Corporation and is issued in strict confidential and shall not be disclosed to others parties in whole or in parts without written permission of BenQ Corporation
The documents contain information on a product, which is under development and is issued for customer evaluation purposes only.
BENQ may make changes to product specifications at any time, without notice**.**

BenQ Corporation.

Networking & Communications BG

18 JiHu Road, Nei-Hu, Taipei 114, Taiwan, R.O.C.

Tel: +886-2-2799-8800

Fax: +886-2-2656-6399
http://www.benq.com

Contents

1. INTRODUCTION ----------11

1.1 Introduction to Interface between TE and MS ---------- 11

1.2 Initial the Test Environment ---------- 14

1.3 How to Handle SMS messages ---------- 14

2. IMPLEMENTED AT COMMANDS FOR MS ----------20

2.1 Commands specified by GSM REC.27.07 ---------- 20

2.1.1 General Commands ---------- 20

Request manufacturer identification +CGMI ---------- 20

Request model identification +CGMM ---------- 20

Request revision identification +CGMR ---------- 21

Request product serial number identification +CGSN ---------- 21

Select TE character set +CSCS ---------- 22

Request international mobile subscriber identity +CIMI ---------- 24

Multiplexing mode +CMUX ---------- 25

PCCA STD-101[17] select wireless network +WS46 ---------- 29

2.1.2 Call control commands ---------- 30

Select Type of Address +CSTA ---------- 30

Call mode +CMOD ---------- 31

Hang up call +CHUP ---------- 31

Select bearer service type +CBST ---------- 32

Radio link protocol +CRLP ---------- 33

Service reporting control +CR ---------- 34

Extended error report +CEER ---------- 36

Cellular result codes +CRC ---------- 36

Single numbering scheme +CSNS ---------- 38

Dial command D ---------- 39

2.1.3 Network service related commands ---------- 40

Subscriber number +CNUM ---------- 40

Network registration +CREG ---------- 41

Operator selection +COPS ---------- 43

Facility Lock AT+CLCK ---------- 45

©2004 BenQ Corporation. **Confidential Property**

Change password +CPWD ----48
Calling line identification presentation +CLIP ----48
Call line identification restriction +CLIR ----50
Connected line identification presentation +COLP ----51
Closed user group +CCUG ----53
Call forwarding service +CCFC ----54
Call waiting service +CCWA ----56
Short string procedure AT+CHLD ----59
Unstructured supplementary service data +CUSD ----61
Advice of Charge +CAOC ----62
Supplementary service notifications +CSSN ----63
Preferred PLMN list +CPOL ----66
List current calls +CLCC ----67
Read operator names +COPN ----69
Get neighbor cells +GNC ----70
2.1.4 Mobile control and status commands ----70
Phone activity status +CPAS ----70
Set phone functionality +CFUN ----71
Enter PIN +CPIN ----73
Battery charge +CBC ----74
Signal quality +CSQ ----75
Restricted SIM access +CRSM ----76
Ringer sound level and ringer type select +CRSL ----78
Loudspeaker volume level +CLVL ----79
Mute +CMUT ----79
Accumulated call meter +CACM ----81
Accumulated call meter maximum +CAMM ----81
Price per unit and currency table +CPUC ----82
Call Meter maximum event +CCWE ----83
Set Voice Mail Number +CSVM ----84
List all available AT commands +CLAC ----85
2.1.5 Commands related with phonebook service ----86
Select phonebook memory storage +CPBS ----86
Read phonebook entries +CPBR ----87
Find phonebook entries +CPBF ----89
Write phonebook entry +CPBW ----90
Report Mobile Equipment error +CMEE ----91
2.1.6 Commands from TIA IS-101 ----92

©2004 BenQ Corporation. Confidential Property

Select mode +FCLASS ---- 92
DTMF and tone generation +VTS ---- 94
Play DTMF tone +WDTMF ---- 95
Receive gain selection +VGR ---- 96
Transmit gain selection +VGT ---- 96

2.2 Commands related to short message service ---- 98
2.2.1 General Configuration Commands ---- 102
Select Message Service +CSMS ---- 102
Preferred Message Storage +CPMS ---- 103
Message Format +CMGF ---- 104
2.2.2 Message Configuration Commands ---- 105
Service Centre Address +CSCA ---- 105
Set Text Mode Parameters +CSMP ---- 106
Show Text Mode Parameters +CSDH ---- 107
Select Cell Broadcast Message Types +CSCB ---- 108
Save Settings +CSAS ---- 110
Restore Settings +CRES ---- 111
2.2.3 Message Receiving and Reading Commands ---- 112
New Message Indications to TE +CNMI ---- 112
List Messages +CMGL ---- 115
Read Message +CMGR ---- 117
NEW Message Acknowledgement to ME/TA +CNMA ---- 118
2.2.4 Message Sending and Writing Commands ---- 119
Send Message +CMGS ---- 119
Send Message from Storage +CMSS ---- 121
Write Message to Memory +CMGW ---- 122
Delete Message +CMGD ---- 123
Send Command +CMGC ---- 123
2.2.5 PDU Mode ---- 124
List Message +CMGL ---- 124
Read Message +CMGR ---- 126
Send Message +CMGS ---- 127
Send Message from Storage +CMSS ---- 128
Write Message to Memory +CMGW ---- 129

2.3 Commands specified by ITU-T Rec. V25ter as by GSM Rec. 07.07 ---- 129
2.3.1 Generic TA control commands ---- 129
Repeating a command line (A/) ---- 129

©2004 BenQ Corporation. Confidential Property

Reset to default configuration (Z)----130
Set to factory-defined configuration (&F)----131
Request identification information (I)----132
Request manufacturer identification (+GMI)----133
Request model identification (+GMM)----134
Request revision identification (+GMR)----134
Request product serial number identification (+GSN)----135
Request complete capabilities list (+GCAP)----136
Command line termination character (S3)----137
Response formatting character (S4)----138
Command line editing character (S5)----139
Command echo (E)----140
Result code suppression (Q)----141
DCE response format (V)----142
Result code selection and call progress monitoring control (X)----143
Circuit 109 (Received line signal detector) behavior (&C)----145
Circuit 108 (Data terminal ready) behavior (&D)----145
Fixed DTE rate (+IPR)----147
DTE-DCE character framing (+ICF)----148
DTE-DCE local flow control (+IFC)----150
DTE-DCE local rate reporting (+ILRR)----151
2.3.2 Call Control commands and response----153
Dial (D)----153
Wait for dial tone (W)----155
Select tone dialling (dial modifier) (T)----156
Select pulse dialing (dial modifier) (P)----156
Answer (A)----157
Hook control (H)----158
Automatic answer (S0)----159
Monitor speaker loudness (L)----160
2.3.3 Data Compression commands----161
Data compression (DS)----161
Data compression reporting (DR)----162

2.4 Command specified by ITU-T Rec. T.32----165
2.4.1 Action commands----165
Send a page +FDT----165
Receive a page +FDR----166
Terminate a session +FKS----167

©2004 BenQ Corporation. Confidential Property

Initialize facsimile parameters +FIP ---- 168
2.4.2 DCE Responses ---- 168
Facsimile Connection +FCO ---- 168
Report DCS Frame Information +FCS ---- 169
Report DTS Frame Information +FTC ---- 171
Report DIS Frame Information +FIS ---- 172
Remote Polling Indication +FPO ---- 172
Report Remote ID +FTI ---- 173
Report Remote ID +FPI ---- 174
Report Remote ID +FCI ---- 174
Report NSC Frames +FNC ---- 175
Report NSF Frames +FNF ---- 175
Report NSS Frames +FNS ---- 176
Report Password +FPW ---- 177
Report Destination Subaddress +FSA ---- 177
Report Polling Address +FPA ---- 178
Report T.30 Phase C Page Reception +FPS ---- 178
Post Page Messages Response +FET ---- 180
Transition to Voice +FVO ---- 180
Call Termination Status +FHS ---- 181
Report Transmit HDLC Frames +FHT ---- 184
Report Received HDLC Frames +FHR ---- 185
2.4.3 Service Commands ---- 186
Service Class +FCLASS ---- 186
DCE Capabilities Parameter +FCC ---- 187
Current Session Parameter +FIS ---- 188
Current Session Result +FCS ---- 189
Local Facsimile Station ID String +FLI ---- 189
Local polling ID String +FPI ---- 190
Non-Standard Frame FIF Octet String +FNS ---- 191
Indicate Document to Poll +FLP ---- 192
Request to Poll +FSP ---- 192
Capability to Receive +FCR ---- 193
HDLC Frame Reporting +FBU ---- 194
Negotiation Reporting +FNR ---- 194
Address and Polling Capabilities +FAP ---- 195
Address and Polling Frames/Subaddress +FSA ---- 196
Address and Polling Frames/Polling Address +FPA ---- 197

©2004 BenQ Corporation. Confidential Property

Address and Polling Frames/Password +FPW ---- 197
Procedure Interrupt Enable +FIE ---- 198
Page Status +FPS ---- 199
Copy Quality Checking +FCQ ---- 200
Receive quality Thresholds +FRQ ---- 201
Adaptive Answer +FAA ---- 202
DTE Phase C Response Timeout +FCT ---- 202
Call Termination Status +FHS ---- 203
ECM Retry Count +FRY ---- 204
Minimum Phase C Speed +FMS ---- 205
Inactivity Timeout +FIT ---- 205
Minimum Phase C Speed +FMS ---- 206
Report Buffer Size +FBS ---- 207
Packet Protocol Control +FPP ---- 207
Data Bit Order +FBO ---- 208
Phase C Received EOL Alignment +FEA ---- 209
Image Data Format Conversion +FFC ---- 209
Modem ID +FMI ---- 210
Model ID +FMM ---- 211
Revision ID +FMR ---- 211
Flow Control +FLO ---- 212
2.4.4 Examples (WinFax Pro) ---- 212
DCE Initialization ---- 212
Send One Page ---- 213
Receive One Page ---- 214

2.5 GPRS related commands ---- 214
2.5.1 Define PDP Context +CGDCONT ---- 214
2.5.2 Quality of Service Profile (Request) +CGQREQ ---- 217
2.5.3 Quality of Service Profile (Minimum acceptable) +CGQMIN ---- 219
2.5.4 GPRS attach or detach +CGATT ---- 222
2.5.5 PDP context activate or deactivate +CGACT ---- 223
2.5.6 Enter data state +CGDATA ---- 225
2.5.7 Show PDP address +CGPADDR ---- 227
2.5.8 Automatic response to a network request for PDP context activation +CGAUTO ---- 229
2.5.9 Manual response to a network request for PDP context activation +CGANS ---- 231
2.5.10 GPRS mobile station class +CGCLASS (GPRS only) ---- 233
2.5.11 Packet Domain event reporting +CGEREP ---- 235
2.5.12 RS network registration status +CGREG ---- 237

©2004 BenQ Corporation. Confidential Property

2.5.13 Select service for MO SMS messages +CGSMS ---------- 239
2.5.14 Request GPRS service 'D' ---------- 240
2.5.15 Automatic response to a network request for PDP context activation 'S0' ---------- 242
2.5.16 Manual acceptance of a network request for PDP context activation 'A' ---------- 243
2.5.17 Manual rejection of a network request for PDP context activation 'H' ---------- 244

2.6 Module-specific AT Commands ---------- 245
2.6.1 Power Off $POWEROFF ---------- 245
2.6.2 Periodic Signal Quality Report $CSQ ---------- 245
2.6.3 Audio Path $AUPATH ---------- 246
2.6.4 Audio Gain $AUGAIN ---------- 248
2.6.5 Audio Mute $AUMUTE ---------- 249
2.6.6 Audio Volume $AUVOL ---------- 249
2.6.7 Audio AEC $AUAEC ---------- 250
2.6.8 Audio FIR $AUFIR ---------- 251
2.6.9 Audio VAD $AUVAD ---------- 252
2.6.10 Audio ABS $AUABS ---------- 253
2.6.11 Audio CONTFLT $AUCONTFLT ---------- 253
2.6.12 Audio AUATT $AUATT ---------- 254
2.6.13 Audio SMOOTH $AUSMOOTH ---------- 255
2.6.14 Audio LEVELMAX $AULEVELMAX ---------- 255
2.6.15 Audio FLT $AUFIL ---------- 256
2.6.16 Audio MUT $AUMUT ---------- 257
2.6.17 SIM Ready Notification $SRN ---------- 257
2.6.18 I/O12 Setting $VCD ---------- 258
2.6.19 Set duration to clip data on incoming call $TRING ---------- 259
2.6.20 Convert UNICODE to GB2312 $UNI2GB ---------- 260
2.6.21 Convert GB2312 to UNICODE $GB2UNI ---------- 260
2.6.22 Play a call tone +GDT ---------- 261
2.6.23 Hardware power off command $HRST ---------- 262

2.7 Proprietary AT Commands ---------- 263
2.7.1 Call progress information %CPI ---------- 263
2.7.2 Configuration for SIM application toolkit %SATC ---------- 268
2.7.3 Send SAT envelope command %SATE ---------- 269
2.7.4 Send SAT command response %SATR ---------- 270
2.7.5 Terminate SAT command or session %SATT ---------- 270
2.7.6 Dynamic Multiband: %BAND ---------- 271
2.7.7 GPRS Attach/Detach Mode: %CGAATT ---------- 271

©2004 BenQ Corporation. Confidential Property

2.7.8 Flash Memory Check $FSCHK---------- 272
2.7.9 Play Tone on Loud Speaker $CLSL ---------- 273
2.7.10 Play Tone on Speaker $CSSL---------- 274
2.7.11 Get PIN1, PIN2, PUK1, PUK2 remaining number %PVRF ---------- 274
2.7.12 SIM Authentication $SIMAUTH ---------- 275
2.7.13 RTC DATE '$DATE'---------- 275
2.7.14 RTC Time '$TIME'---------- 276
2.7.15 Green LED Setting $GLED---------- 277

2.8 M2M: Machine to Machine ---------- 279
2.8.1 PCO string for context activation '%CGPCO'---------- 279
2.8.2 TCP/IP Timeout for M2M packet '$TIMEOUT' ---------- 279
2.8.3 TCP/IP Remote destination Server information '$DESTINFO'---------- 280

2.9 Error Message ---------- 282
2.9.1 Mobile Equipment error result code +CME ERROR: <unsolicited><p>---------- 282
2.9.2 Message Service Failure Result Code +CMS ERROR: <unsolicited><p> ---------- 284

©2004 BenQ Corporation. Confidential Property

M22 AT Command User Manual Revision History			
SW Version	**Content**	**Author**	**Date**
0.4	Add AT+WDTMF, $SRN, $VCD, $TRING	Jamie CW Wang	2004/02/09
	Add AT$UNI2GB, $GB2UNI	Eason Liu	2004/02/13
	Add AT+GDT, modify AT+CMGR	Ken Chang	2004/03/03
1.0	Add AT$AUVAD, $AUABS, $AUFIR	William Hsieh	2004/03/25
	Add AT$HSRT, modify $UNI2GB, $GB2UNI	Kelvin Chan, Jamie CW Wang	2004/04/02
1.1	Add AT%CGPCO,AT$TIMEOUT,AT$DESTINFO	Kelvin Chan Jamie CW Wang	2004/4/27
1.2	AT$AUFIR, AT$AUVAD, AT$AUABS, AT$AUCONTFLT, AT$AUATT, AT$AUSMOOTH, AT$AULEVELMAX, AT$AUFIL, AT$AUMUT	William Hsieh	2004/05/28

1. Introduction

1.1 Introduction to Interface between TE and MS

In order to communicate each other between TE and MS, we must use AT commands. Figure 1.1 illustrates the interface. In section 2, we will divide the content into ten subsections. They are about SIM, list management, mobility management, call control, supplementary service, short message, cell broadcast, base-band and the other service.

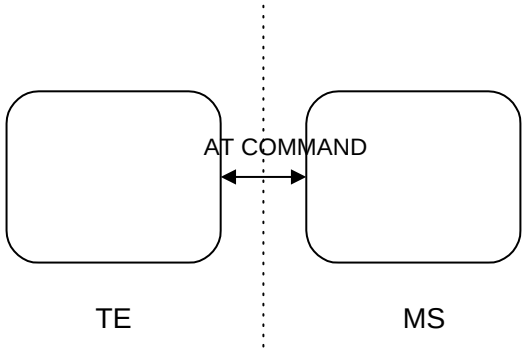


Figure 1.1

Explanation

ME	Mobile equipment
MS	Mobile station. Basically, a mobile station is mobile equipment with a SIM card.
TE	Terminal Equipment that is the same as the controller in this case.

Getting started

For testing AT commands, the MS can be connected to any computer environment, as long as it has a V.24/V.28 serial interface. The commands can be issued with, for example, HyperTerminal in Microsoft Windows or other emulator programs.

Syntax description

The section gives a brief description of the syntax used for the command set. The MS may echo characters received, depending on the setting of the command E. As a default, echo is enabled, and characters are echoed at the same rate, parity, and format as received.

The character defined by parameter S5 (default, BS, IRA 8) is interpreted as request from the TE to delete the previous character.

<CR>	Carriage return character, whose value is specified by command S3, default IRA 13.
<LF>	Line feed character, whose value is specified by command S4, default IRA 10.
<…>	The name enclosed in angle brackets is a syntactical element. The brackets do not appear in the command line.
[…]	Strings enclosed in square brackets are optional items (sub-parameters). The brackets do not appear in the command line.

Other characters, including '?','=', parentheses, etc, appear in commands and response as written.

AT command syntax

A command line is made up of three elements: the prefix, the body and the termination character. The command line prefix consists of the characters 'AT'.

MS supports a set of commands referred to as basic syntax commands, and a set of extended syntax commands, the latter prefixed with a plus sign (+).

Basic syntax command

The format of basic syntax commands, except for the command D, is as follows:

<name>[<value>]

Example: ATV1<CR> (set text form result codes)
<CR><LF>OK<CR><LF>(response)

Extended syntax command

+<name>[=<value>]

Example: AT+CMUT=0<CR>(the representation of signal strength)
<CR><LF>OK<CR><LF>(response)

Test command syntax

+<name>=?

Example: ATS3=?<CR>(show supported S3 values)
<CR><LF>S3: (0-127)<CR><LF>
<CR><LF>OK<CR><LF>

Read command syntax

+<name>?

©2004 BenQ Corporation. Confidential Property

Example: AT+CACM?<CR>(show current accumulated call meter value)
<CR><LF>+CACM: ”0”<CR><LF>(response)
<CR><LF>OK<CR><LF>

If the indicated name is not recognized, an Error code is issued.

AT response syntax

The default response is text mode that is shown below. See the command V for further details. The format of a response is as follows:

<CR><LF>[<response>]<CR><LF>

The <response> can be:

- Basic format result code, such as OK.
- Extended syntax result code, prefixed with a plus sign (+) :
  +<name>: <value>

The result codes are separate by commas if it’s included several values. The <value> followed by the colon is separated by a space. It is also possible that result codes have no value. Unlike basic format result codes, extended syntax result codes have no numeric equivalent, and are always issued in alphabetic form.

There are two types of result code responses:

Final result code

A final result code indicates to the TE that execution of the command is completed and another command may be issued.

If you typed an implemented AT command, you should get the result code OK.

If you typed an AT command that was not implemented, or which had the wrong parameter or syntax, you will get the result code ERROR or else, for example, +CME ERROR followed by an error code.

Unsolicited result code

Unsolicited result codes, such as RING, indicate the occurrence of an event not directly associated with a command being issued from TE.

©2004 BenQ Corporation. Confidential Property

1.2 Initial the Test Environment

Initial the HyperTerminal.

-Start HyperTerminal
-Name a new connection
-Select the connection port
-Initial the connection port with 115200 bps and none flow control

Initial the MS.

-Put the SIM card into ME and power on the ME.
-Start all of AT Commands with ‘‘AT+CFUN=1’’
-Camp on the cell with ‘‘AT+COPS=0’’

1.3 How to Handle SMS messages

This section gives examples of the AT commands for sending and receiving SMS (Short Messages Service) messages.
Whatever the destination of the SMS message, the message is always sent via a Service Center (SC). One of the SC’s jobs, among others, is to forward SMS messages to the destination, or save the SMS until the receiving MS becomes available in the GSM network. The message can be stored at the SC up to a maximum time period decided by the sender. Also the message is “time stamped” at the SC and its contents are interpreted according to choices made by the sender.
The conclusion of this is that an SMS message, along with other information decided upon by the sender, always contains 2 addresses. First the Service Center Address (SCA), and then the destination address. Also, other useful information is added at the SC.

Setting Service Center Address (SCA)

The service center address is usually stored on the SIM card, but it can be set manually by using the AT command AT+CSCA. Note that the SCA must be given in the international phone number format.

Format of an SMS message

It is important to realize that SMS messages could be sent in two modes: text mode and PDU mode, which is described in detail in the GSM specifications 3GPP 27.005, 3GPP 23.040 and 3GPP 23.038.
Because text mode is followed the format of input parameters, it is clear to execute

the commands. We now focus on the introduction of PDU mode.
What is PDU mode? First a PDU is a Service Center Address (SCA) followed by a Transport Protocol Data Unit (TPDU). There are several formats of TPDU, but we now only use two forms here:

SMS-SUBMIT TPDU	Outgoing SMS messages “submitted” to the SM from the originating MS.
SMS-DELIVER TPDU	Incoming SMS messages “delivered” by the SC to final destination MS.

Therefore we have the following general format of an SMS message:

PDU=SCA+TPDU

The TPDU format is a hexadecimal encoded binary format, which means that 2 hexadecimal digits represent a byte or an octet. In general there is a header part of the TPDU, containing the control information, and the follows user data, which can be any type of information (default 7-bit GSM alphabet, 8-bit ISO 8859-1 alphabet or even 8-bit data).

Let’s start with some examples of PDU SMS messages using an SMS-SUBMIT type TPDU. For simplicity’s sake we will send a text message that reads “TEST”, using the default GSM 7-bit alphabet.

Here is the message written out in full:

0011000B916407861582F50000A704D4E2940A

Equivalently, we could write this as:

07916407058099F911000B916407861582F50000A704D4E2940A

These two have one difference, and that is how we have chosen to describe the SCA. In the first SMS we use:

00	This is a valid SCA with a length equal to zero. Therefore we are using the default SCA given by the SIM card, or as given by the AT command AT+CSCA.
07916407058099F9	Here is the SCA hex encoded binary. The first octet (07) is a length indicator, in this case there are 7 octets to follow. The second octet (91) tells us about the numbering plan and type of number of the coming address. In this case the 91 says that the address is in international phone number format. Then follows the

©2004 BenQ Corporation. Confidential Property

actual service center address (6407058099F9). Every pair of digits is swap, that there is an odd number of digits in the phone number and therefore, a half byte of fill digits is required at the end (hence the hexadecimal F9). The exact meaning of all the octets and fields in the SCA address is described in detail in 3GPP 23.040.

Let's analyze the message by breaking it down into its component parts:

11 — This octet contains many 1-bit and 2-bit fields that are described in detail in GSM 03.40. These include:

- TP-MTI : message type indicator
- TP-RD : more messages waiting indicator
- TP-VPF : validity period format
- TP-SRR : status report request flag
- TP-UDHI : user data header indicator flag
- TP-RP : reply path setting flag

00 — This octet is only associated with the 8-bit field TP-MR and is basically a message reference number, which can be chosen by the user. Here we set the message reference number to zero (00HEX).

0B916407861582F5 — This is the destination address (TP-DA). The format of the address field is given in detail in 3GPP 23.040. It is similar to the format of the SCA, but now it refers to the phone number of the receiving MS. The first octet (0B) is a phone number length indicator. In this case the phone number of the destination MS consists of 11 digits. The second octet (91) is the numbering plan and type of number of the coming address. The address is in international phone number format. Then follows the mobile number with every pair of digits in reverse order, and because we have an odd number of digits a half octet of fill bits are required (hence the F5HEX).

00 — This is the protocol ID (TP-PID) which refers to a possible higher level protocol being used or indicates inter-working with certain types of telematic devices. This can usually be left set to zero.

00 — This is the data coding scheme field (TP-DCS) that is described in detail in 3GPP 23.038. Basically this octet

	tells us what kind of user data is being sent. For instance, if we are using a 7-bit or 8-bit alphabet, or we are sending 8-bit data. It also informs the receiving MS about the class of the SMS message, which tells it how to handle and store the incoming SMS message.
A7	This is the validity period (TP-VP). The validity period is how long the SC will store the SMS, waiting for the receiving MS to come in contact with the GSM network. If the SMS is not received by the destination MS within this time, then the message will be discarded. 3GPP 23.040 describes this field in detail.
04	TP-UDL. This is the length of the user data. It is given in septets, if TP-DCS describes the message as using the default 7-bit GSM alphabet, or octets otherwise.
D4E2940A	Finally we come to the user data (TP-UD). This is 4-septets long, defined above in TP-DCS and TP-UDL. The message reads “TEST”. Note the one character is not represented by one octet, but by a septet (7-bits), and therefore it can be quite complicated to decipher a GSM text SMS by looking at the PDU. 3GPP specification 23.038 describes in detail how the 7-bit GSM alphabet works and how to convert from the hexadecimal to the characters. You may know that one can send 160 characters in an SMS message. This is only possible in 140 bytes using a 7-bit alphabet

Before we finish we should also take a look at the TPDU of SMS-DELIVER type. This is the PDU one would see when reading an SMS that has been sent to the module.

07916407058099F9040B916407861582F500009910702123040004D4E2940A

The TPDU breaks down as follows:

04	TP-MTI, TP-MMS, TP_SRI, TP-UDHI, TP-RP
0B916407861582f5	This is the originating address (TP-OA)
00	TP-PID
00	TP-DCS
99107021230400	This is the service center time stamp. Every pair of digits are reversed. This time stamp reads, in octets from left to right: the date 990107 (year, month, day), the time 123240 (hours, minutes, seconds). Finally the

©2004 BenQ Corporation. Confidential Property

	last octet is a reference for the difference in time between local time and GMT.
04	TP-UDL
D4E2940A	TP-UD

Sending SMS messages

The AT command to use is AT+CMGS. Notice that this is the length of the TPDU and not the PDU, so it does not include the SCA. The length of the message is 4 octets and the message reads “TEST”.

Example1:

A user would like to send a GSM 7 bit alphabet text “TEST” to number “0910123456”, he may use

AT+CMGS=17<CR>

>0011000A8190012143650000A704D4E2940A<CTRL-Z>

+CMGS:122 (depends on the MS)

OK

Reading SMS message from storage

To read SMS messages from storage, the AT commands AT+CMGL and AT+CMGR should be used.

Example1:

AT+CMGR=1

+CMGR: 1,,23

07916407058099F9040B916407950303F10000892122214014000 4D4E2940A

OK

Example2:

AT+CMGL=4 The 4 here means “all messages”.

+CMGL: 1,1,23

07916407058099F9040B916407950303F10000892122214014000 4D4E2940A

+CMGL: 2,1,26

07916407058099F9040B916407950303F10000892122216000000841E190583411E91

+CMGL: 3,1,27

07916407058099F9040B916407950303F10000892122217064000941E19058341E9149

OK

Deleting SMS messages

To delete an SMS message from the selected <mem1>, use the AT+CMGD command.

Example1:
AT+CMGD=1
OK

Memory management

Once both SM are full, then the module will receive no new messages and SMS messages will be buffered in the Service Center until the following happens:

- The validity period of the message expires. The validity period is set by TP-VP.
- A message is deleted by using AT+CMGD. An empty memory position becomes available and the module can receive a new message.

There are other ways to control the storage of SMS messages. In the TPDU field, TP-DCS, one can set the class of the SMS message. Basically the different SMS classes are as follows:

Classless SMS	(TP-DCS=00hex). This is usually the type sent by a mobile telephone. They are stored in the available memory.
Class 0 SMS	(TP-DCS=F0hex). These are not stored anywhere, but are sent directly to the telephone display. Since there is no display one can forward the messages to the TE by means of the AT command setting AT+CNMI=3,2
Class 1 SMS	(TP-DCS=F1hex). These are directed specifically to ME if there is a memory storage available, otherwise it will be stored in SM.
Class 2 SMS	(TP-DCS=F2hex). These are directed specifically to SM.
Class 3 SMS	(TP-DCS=F3hex). These messages shall normally be transferred to the terminal equipment or application, if requested to do so, This is controlled by the AT command AT+CNMI

For a deeper explanation and more information regarding the different SMS classed and their use see the 3GPP specification 23.038.

©2004 BenQ Corporation. Confidential Property

2. Implemented AT commands for MS

2.1 Commands specified by GSM REC.27.07

2.1.1 General Commands

Request manufacturer identification +CGMI

Table: +CGMI parameter command syntax

Command	Possible response(s)
+CGMI	<manufacturer> +CME ERROR: <err>

Description

Read handset or model's manufacturer's ID.

Defined values

<manufacturer> : total number of characters shall not exceed 2048.

Informative examples

-Initial the HyperTerminal

-Initial the MS

-AT Command

AT+CGMI<CR>

BenQ

Request model identification +CGMM

Table: +CGMM parameter command syntax

Command	Possible response(s)
+CGMM	<model> +CME ERROR: <err>

Description

Read model information which determined by ME manufacturer.

Defined values

<model id>: string type

Informative examples

-Initial the HyperTerminal

-Initial the MS without SIM card

-AT Command

AT+CGMM <CR>

<model>

Request revision identification +CGMR

Table: +CGMR parameter command syntax

Command	Possible response(s)
+CGMR	<revision> +CME ERROR: <err>

Description

Read revision of ME. It may include software and hardware revision.

Defined values

<revision >: information text

Informative examples

-Initial the HyperTerminal

-Initial the MS without SIM card

-AT Command

AT+CGMR<CR>

SW ver: 1.0.9

HW ver: 1.0

FS ver: 0.4.8.0

Build Date: 2003/10/24

Build Time: 14:17:57

Request product serial number identification +CGSN

Table: +CGSN parameter command syntax

Command	Possible response(s)
+CGSN	<sn> +CME ERROR: <err>

Description

Read serial number identification which determined by ME manufacturer.

Defined values

<sn >: total number of characters shall not exceed 2048 characters.

Informative examples

-Initial the HyperTerminal

-Initial the MS without SIM card

-AT Command

AT+CGSN<CR>

IMEI: 44601919750759-5

IMEISV: 44601919750759-00

OK

Select TE character set +CSCS

Table: +CSCS parameter command syntax

Command	Possible response(s)
+CSCS=[<chset>]	
+CSCS?	+CSCS: <chset>
+CSCS=?	+CSCS: (list of supported <chset>s)

Description

Set command informs TA of which character set "<chset>" is used by the TE. TA is then able to convert character strings correctly between TE and ME character sets.

When TA-TE interface is set to 8-bit operation and used TE alphabet is 7 bit, the highest bit shall be set to zero.

Read command returns the current setting and test command displays conversion schemes implemented in the TA.

Note Appendix D will explain the correspondence between TE and ME at phonebook commands, such as +CPBR,+CNUM,+CPBW,+CPBF.

Defined values

<chset>: string type

Command	Possible response(s)
“GSM”(default)	GSM default alphabet
“HEX”	Character strings consist only of hexadecimal numbers from 00 to FF;e.g. “032FE6” equals three 8-bit characters with decimal values 3,47 and 230;no conversions to the original ME character set shall be done.
“IRA”	International reference alphabet
“UCS2”	16-bit universal multiple-octet coded character set; UCS2 character strings are converted to hexadecimal numbers from 0000 to FFFF. ; e.g. “004100620063” equals three 16-bit characters with decimal values 65,98 and 99.
“8859-1”	ISO 8859 Latin 1 character set
“PCCP437”	PC character set Code Page 437
“PCDN”	PC Danish/Norwegian character set

Informative examples

-Initial the HyperTerminal

-Initial the MS without SIM card

-AT Command

1.

AT+CSCS=? <CR>

+CSCS: "GSM","IRA","PCCP437","PCDN","8859-1","HEX","UCS2"

OK

2.

AT+CSCS= “GSM”

+CSCS: “GSM”

OK

AT+CSCS? <CR>

+CSCS: “GSM”

OK

3.

AT+CSCS=”UCS2”

OK

AT+CPBS=?

+CPBS: "SM",7,100
OK
AT+CPBR=1,3
+CPBR: 1,"12345",129,"00520061006E00640079"
+CPBR: 2,"2",129,"004300610020"
+CPBR: 3,"3",129,"00450020"
AT+CSCS=”IRA”
OK
AT+CPBR=1,3
+CPBR: 1,"12345",129,"Randy"
+CPBR: 2,"2",129,"Ca "
+CPBR: 3,"3",129,"E "
OK

Request international mobile subscriber identity +CIMI

Table: +CIMI parameter command syntax

Command	Possible response(s)
+CIMI	+CIMI: <IMSI> +CME ERROR:<err>

Description

Execution command causes the TA to return <IMSI>, which is intended to permit the TE to identify the individual SIM that is attached to ME.

Defined values

<IMSI>: International Mobile Subscriber Identity (string without double quotes)

Informative examples

-Initial the HyperTerminal
-Initial the MS
-AT Command
AT+CIMI
+CIMI: 466880100493652

OK

©2004 BenQ Corporation. Confidential Property

Multiplexing mode +CMUX

Table: +CMUX parameter command syntax

Command	Possible response(s)
+CMUX=<mode>[,<subset>[,<port_speed>[,<N1>[,<T1>[,<N2>[,<T2>[,<T3>[,<k>]]]]]]]	+CME ERROR:<err>
+CMUX?	+CMUX: <mode> [,<subset>], <port_speed>, <N1>,<T1>,<N2>,<T2>,<T3>,<k> +CME ERROR:<err>
+CMUX=?	+CMUX: (list of supported <mode>s), (list of supported <subset>s), (list of supported <port_speed>s), (list of supported <N1>s), (list of supported <T1>s), (list of supported <N2>s), (list of supported <T2>s), (list of supported <T3>s), (list of supported <k>s)

Description

This command is used to enable/disable the GSM 07.10 multiplexing protocol control channel. Refer to subclause 9.2 for possible <err> values. The AT commands sets parameters for the Control Channel. If the parameters are left out, the default value is used.

Read command returns the current mode and the settings.

Test command returns the supported modes and parameters.

It is recommended that the ME/TA/TE should autobaud to the +CMUX command up to and including an interface speed of 9600 bits/s.

The OK or +CME ERROR: <err> response is returned at the speed of the +CMUX command prior to entering <mode>.

It is recommended that whenever the multiplexer control channel is released the ME/TA/TE should assume an interface rate of up to and including 9600 bits/s for auto bauding purposes irrespective of any previous higher speed having been selected.

©2004 BenQ Corporation. Confidential Property

If a +CMUX command is issued whilst in any multiplexer mode then that +CMUX command shall be ignored and the ME/TA shall return an +CME ERROR: <err> response.

Defined values

<operation> (multiplexer Transparency Mechanism)

0 Basic option (not support in current version)

1 Advanced option

<subset>:

This parameter defines the way in which the multiplexer **control channel** is set up. A virtual channel may subsequently be set up differently but in the absence of any negotiation for the setting of a virtual channel, the virtual channel shall be set up according to the control channel <subset> setting.

0 UIH frames used only.

1 UI frames used only.

2 I frames used only.

Default value:0

<port_speed> (transmission rate):

1 9600 bits/s

2 19200 bits/s

3 38400 bits/s

4 57600 bits/s

5 115200 bits/s

6 230400 bits/s

<N1> (maximum frame size):

1-32768

default Value: 31 (64 if Advanced option is used)

<T1> (acknowledgement timer in units of ten milliseconds):

1-255, where 10 is default (100 ms)

<N2> (maximum number of re-transmissions):

0-100, where 3 is default

<T2> (response timer for the multiplexer control channel in units of ten

©2004 BenQ Corporation. Confidential Property

milliseconds):
2-255,where 30 is default (300ms)
NOTE: T2 must be longer than T1.

<T3> (wake up response timer in seconds):
1-255, where 10 is default

<k> (window size, for Advanced operation with Error Recovery options):
1-7, where 2 is default

Informative examples

-Initial the HyperTerminal
-Initial the MS
-AT Command
AT+CMUX=?
+CMUX: (1),(0),(1-5),(10-100),(1-255),(0-100),(2-255),(1-255),(1-7)
OK

Mux Example

Request: 92/8/3 下午 05:38:36.812492864 (+300.4480146000 seconds)

```
41 54 45 30 51 30 56 31 0D                      ATE0Q0V1

Normal AT command mode at initial
```

Answer: 92/8/3 下午 05:38:36.822507464 (+0.0100146000 seconds)

```
0D 0A 4F 4B 0D 0A                               ..OK..
The response of ATE0Q0V1
```

Request: 92/8/3 下午 05:38:37.583617064 (+0.5908614000 seconds)

```
41 54 2B 43 4D 55 58 3D 31 2C 30 2C 35 0D       AT+CMUX=1,0,5.

Mux mode enable command   Advanced without error recovery
```

Answer: 92/8/3 下午 05:38:37.593631664 (+0.0100146000 seconds)

```
0D 0A 4F 4B 0D 0A                                  ..OK..

The response of MUX mode command
From now on all command and information should be encapsulated with HDLC format
```

Request: 92/8/3 下午 05:38:38.394799664 (+0.8011680000 seconds)

7E 03 3F FC 7E **~.?ü~**

First SABM packet to start DLC 0 (that is , disconnected mode)

Answer: 92/8/3 下午 05:38:38.404814264 (+0.0100146000 seconds)

7E 03 73 85 7E **~.s ~**

The ACK of first SABM

After the response packet is send , the control channel ,DLC 0 is established

Request: 92/8/3 下午 05:38:38.655179264 (+0.2503650000 seconds)

7E 07 3F 89 7E **~.? ~**

Send the second SABM packet to start DLC 1

Answer: 92/8/3 下午 05:38:38.655179264 (+0.0000000000 seconds)

```
7E 07 73 F0 7E 7E 01 FF E3 05 07 0D B6 7E 7E 05   ~.sð~~.ÿã...¶~~.
EF 41 54 2D 43 6F 6D 6D 61 6E 64 20 49 6E 74 65   ïAT-Command Inte
72 70 72 65 74 65 72 20 72 65 61 64 79 0D 0A DF   rpreter ready..ß
7E 7E 01 FF E3 05 07 0D B6 7E 7E 01 FF E3 05 07   ~~.ÿã...¶~~.ÿã..
0D B6 7E 7E 01 FF E3 05 07 0D B6 7E                .¶~~.ÿã...¶~
```

There are sequence responses form the module, let's analyze step by step

7E 07 73 F0 7E

The ACK of DLC 1, there are two DLC exist now

7E 01 FF E3 05 07 0D B6 7E

UIH control frame to DLC 1 with modem status message

7E 05 EF 41 54 2D 43 6F 6D 6D 61 6E 64 20 49 6E 74 6572 70 72 65 74 65 72 20 72 65 61 64 79 0D 0A DF 7E

UIH information frame to DLC 1 , it's a normal information.

Note that the information field

"41 54 2D 43 6F 6D 6D 61 6E 64 20 49 6E 74 6572 70 72 65 74 65 72 20 72 65 61 64 79 0D 0A" is the string "AT-Command Interpreter ready.." to note the TE.

This field is quiet different form UIH control frame, user should take care about this.

7E 01 FF E3 05 07 0D B6 7E

UIH control frame to DLC 1 with modem status message

(retransmit)

7E 01 FF E3 05 07 0D B6 7E

UIH control frame to DLC 1 with modem status message (retarnsmit)

As you can see the TE do not response the UIH control frame at all. The module just retransmit the frame until for N2 times. After retrying N2 times, the module give up.

PCCA STD-101[17] select wireless network +WS46

Table: +WS46 parameter command syntax

Command	Possible response(s)
+WS46=[<n>]	
+WS46	<n>
+WS46=?	(list of supported <n>s)

Description

Set command selects to WDS side stack <n> to be used by the TA. Read command shows current setting and test command displays side stacks implemented in the TA.

Defined values

<n>:12 GSM digital cellular

Informative example

-Initial the HyperTerminal

-Initial the MS without SIM card

-AT Command

AT+WS46=?

+WS46: (12)

OK

AT+WS46?

+WS46: 12

OK

©2004 BenQ Corporation. Confidential Property

2.1.2 Call control commands

Select Type of Address +CSTA

Table: +CSTA parameter command syntax

Command	Possible response(s)
+CSTA=<type>	OK
+CSTA?	+CSTA: <type>
+CSTA=?	+CSTA: (list of supported <type>s)

Description

Set command selects the type of number for further dialing command (D) according to GSM/UMTS specifications. Test command returns values supported by the TA as a compound value.

Defined values

<type>: type of address octet in integer; default 145 when dialing string includes international access code character "+", otherwise 129.

Informative examples

-Initial the HyperTerminal

-Initial the MS

-AT Command

AT+CSTA=?

+CSTA: (129,145)

OK

AT+CSTA?

+CSTA: 129

OK

AT+CSTA=161

OK

AT+CSTA?

+CSTA: 161

OK

AT+CSTA=128

OK

AT+CSTA?

+CSTA: 128
OK

Call mode +CMOD

Table: +CMOD parameter command syntax

Command	Possible response(s)
+CMOD=[<mode>]	
+CMOD?	+CMOD: <mode>
+CMOD=?	+CMOD: (list of supported <mode>s)

Description

Set command selects the call mode of further dialing commands (D) or for next answering command (A). Mode can be either single or alternating. Test command returns values supported by the TA as a compound value.

Defined values

<mode> : 0 single mode
1 alternating voice/fax (teleservice 61)
2 alternating voice/data (bearer service 61)
3 voice followed by data (bearer service 81)

Informative examples

-Initial the HyperTerminal
-Initial the MS
-AT Command
AT+CMOD=?
+CMOD: (0-3)
OK

AT+CMOD?
+CMOD: 0
OK

Hang up call +CHUP

Table: +CHUP parameter command syntax

Command	Possible response(s)

+CHUP	

Description

Execution command causes the TA to hang up the current GSM/UMTS call of the ME.

Select bearer service type +CBST

Table: +CBST parameter command syntax

Command	Possible response(s)
+CBST=[speed>[,<name>[,<ce>]]]	
+CBST?	+CBST: <speed>,<name>,<ce>
+CBST=?	+CBST: (list of supported <speed>s),(list of supported <name>s), (list of supported <ce>s)

Description

Set command selects the bearer service <name> with data rate <speed>, and the connection element <ce> to be used when data calls are originated. Values may also be used during mobile terminated data call setup, especially in case of single numbering scheme calls.

Test command returns values supported by the TA as compound values.

Defined values

<speed> :

1 300 bps (V.21)
2 1200 bps (V.22)
3 1200/75 bps (V.23)
4 2400 bps (V.22bis)
5 2400 bps (V.26ter)
6 4800 bps (V.32)
7 9600 bps (V.32)
12 9600bps (V.34)
14 14400 bps (V.34)
34 1200 bps (V.120)
36 2400 bps (V.120)
38 4800 bps (V.120)

39 9600 bps (V.120)
43 14400 bps (V.120)
65 300 bps (V.110)
66 1200 bps (V.110)
68 2400 bps (V.110 or X.31 flag stuffing)
70 4800 bps (V.110 or X.31 flag stuffing)
71 9600 bps (V.110 or X.31 flag stuffing)
75 14400 bps (V.110 or X.31 flag stuffing)

<name>:
0 data circuit asynchronous (UDI or 3.1k HZ modem)
< ce>:
0 transparent
1 non-transparent
2 both, transparent preferred
3 both, non-transparent preferred

Informative examples

-Initial the HyperTerminal
-Initial the MS
-AT Command
AT+CBST=?
+CBST: (0-7,12,14,34,36,38,39,43,65,66,68,70,71,75), (0), (0-3)
OK

AT+CBST?
+CBST: 7,0,1
OK

Radio link protocol +CRLP

Table: +CRLP parameter command syntax

Command	Possible response(s)
+CRLP=[<iws>[,<mws>[,<T1>[,<N2>]]]	
+CRLP=?	+CRLP: <iws>,<mws>,<T1>,<N2> [<CR><LF>+CRLP:<iws>,<mws>,<T1>,<N2> […]]

©2004 BenQ Corporation. Confidential Property

+CRLP=?	+CRLP: (list of supported <iws>s), (list of supported <mws>s), (list of supported <T1>s),

Description

Radio link protocol (RLP) parameters used when non-transparent data calls are originated may be altered with set command. Available command subparameters depend on the RLP versions implemented by the device (currently only version 1 is supported).

Read command returns current setting for supported RLP version. Test command returns values supported by the TA as a compound value.

Defined values

<iws>,<mws>,<T1>,<N2>: IWF to MS window size, MS to IWF window size, acknowledgement timer T1, retransmission attempts N2: T1 is in units of 10 ms.

Informative examples

-Initial the HyperTerminal
-Initial the MS
-AT Command
AT+CRLP=?
+CRLP: (0-61), (0-61), (39-255),(1-255)
OK

AT+CRLP?
+CRLP: 61,61,48,6
OK

Service reporting control +CR

Table: +CR parameter command syntax

Command	Possible response(s)
+CR=[<mode>]	
+CR?	+CR: <mode>
+CR=?	+CR: (list of supported <mode>s)

Description

Set command controls whether or not intermediate result code +CR: <serv> is returned from the TA to the TE. If enabled, the intermediate result code is transmitted at the point during connect negotiation at which the TA has determined which speed and quality of service will be used, before any error control or data compression reports are transmitted, and before the intermediate result code CONNECT is transmitted.

Defined values

<mode> :

0 disables reporting

1 enables reporting

<serv>:

ASYNC asynchronous transparent

SYNC synchronous transparent

REL ASYNC asynchronous non-transparent

REL SYNC synchronous non-transparent

Informative examples

-Initial the HyperTerminal

-Initial the MS

-AT Command

AT+CR=?

+CR: (0,1)

OK

AT+CR?

+CR: 0

OK

AT+CR=1

+CR:1

OK

ATD024496688;

+CR: REL ASYNC

CONNECT

Extended error report +CEER

Table: +CEER parameter command syntax

Command	Possible response(s)
+CEER	+CEER: <report>

Description

Execution command causes the TA to return one or more lines of information text <report>, determined by the ME manufacturer, which should offer the user of the TA an extended report of the reason for

- the failure in the last unsuccessful call setup or in-call modification;
- the last call releases;

Typically, the text will consist of a single line containing the cause Information given by GSM/UMTS network in textual format.

Defined values

<report>: the total number of characters shall not exceed 2041 characters.

Informative examples

-Initial the HyperTerminal
-Initial the MS
-AT Command

AT+CEER
+CEER: no error
OK

ATD0920123456;
OK
NO CARRIER (disconnect by remote side)

AT+CEER
+CEER: normal call clearing
OK

Cellular result codes +CRC

Table: +CRC parameter command syntax

Command	Possible response(s)

©2004 BenQ Corporation. Confidential Property

+CRC=[<mode>]	
+CRC?	+CRC: <mode>
+CRC=?	+CRC: (list of supported <mode>s)

Description

Set command controls whether or not the extended format of incoming call indication is used. When enabled, an incoming call is indicated to the TE with unsolicited result code +CRING: <type> instead of the normal RING.

Test command returns values supported by the TA as a compound value.

Defined values

<mode> :

0 disables extended format

1 enables extended format

<type>

ASYNC asynchronous transparent

SYNC synchronous transparent

REL ASYNC asynchronous non-transparent

REL SYNC synchronous non-transparent

FAX facsimile (TS 62)

VOICE normal voice (TS 11)

VOICE/*XXX* voice followed by data (BS81) (XXX is ASYNC, SYNC, REL ASYNC or REL SYNC)

ALT VOICE/*XXX* alternating voice/data, voice first (BS 61)

ALT *XXX*/VOICE alternating voice/data, data first (BS 61)

ALT VOICE/FAX alternating voice/fax, voice first (TS 61)

ALT FAX/VOICE alternating voice/fax, fax first (TS 61)

GPRS <PDP_type>, <PDP_addr>[,[<L2P>][,<APN>]] GPRS network request for PDP context activation

<PDP_type>, <PDP_addr> and <APN> are as defined in the Define PDP Context (+CGDCONT) command. The optional <L2P> proposes a layer 2 protocol to use between the MT and the TE. It is defined in the Enter GPRS Data Mode (+CGDATA) command.

Informative example

-Initial the HyperTerminal
-Initial the MS
-AT Command
AT+CRC?
+CRC: 0
OK

AT+CRC=?
+CRC: (0,1)
OK

AT+CRC=1
OK
+CRING: VOICE (MT call)

Single numbering scheme +CSNS

Table: +CSNS parameter command syntax

Command	Possible response(s)
+CSNS=[<mode>]	
+CSNS?	+CSNS: <mode>
+CSNS=?	+CSNS: (list of supported <mode>s)

Description

Set command selects the bearer or teleservice to be used when mobile terminated single numbering scheme call is established. Parameter values set with +CBST command shall be used when <mode> equals to a data service.

Test command returns values supported by the TA as a compound value.

Defined values

<mode> :

0 voice
1 alternating voice/fax, voice first (TS 61)
2 fax (TS 62)
3 alternating voice/data, voice first (BS 61)
4 data
5 alternating voice/fax, fax first (TS 61)

©2004 BenQ Corporation. Confidential Property

6 alternating voice/data, data first (BS 61)
7 voice followed by data (BS 81)

Informative example

-Initial the HyperTerminal
-Initial the MS
-AT Command
AT+CSNS=?
+CSNS: (0-7)
OK

AT+CSNS?
+CSNS: 0
OK

AT+CSNS=8
ERROR

Dial command D

ATD<dial string>[I/I] [G/g] [;]

When semicolon character is given after dialing digits (or modifiers), a voice call originated to the given address.

I or I (override the CLIR supplementary service subscription default value for this call; I=invocation (restrict CLI presentation) and i = suppression (allow CLI presentation).

G or g (control the CUG supplementary service information for this call; uses index and info values set with command +CCUG.

Direct dialing from phonebooks

1. ATD><str>[I] [G] [;]

Originate call to phone number which corresponding alphanumeric field is <str> (if possible, all available memories should be searched for the correct entry).

2. ATD>mem<n> [I] [G] [;]

Originate call to phone number in memory “mem” entry location <n> (mem is “SM”, “LD”, “MC”, “ME”, “RC”, “MT” or “SN”. Available memories may be queried with Select Phonebook Storage test command +CPBS=?)

3. ATD><n> [I] [G] [;]

Originate call to phone number in entry location <n> (it is manufacturer specific which memory storage of ME, SIM/UICC and TA is used; command Select Phonebook Memory Storage +CPBS setting is recommended to be used).

Informative examples

-Initial the HyperTerminal

-Initial the MS

-Initial the alpha id of first physical record in AND is “A”

-AT Command

(1) Dial number 188

ATD188;

OK

(2) Dial number in phonebook index 6.

AT+CPBS?

+CPBS: “SM”

OK

ATD>SM6;

OK

2.1.3 Network service related commands

Subscriber number +CNUM

Table: +CNUM parameter command syntax

Command	Possible response(s)
+CNUM	[+CNUM: [<alpha1>],<number1>, <type1> […<CR><LF>+CNUM: [alphaX>],<numberX>, <typeX>]] +CME ERROR:<err>

Description

Set command returns the MSISDN related to the subscriber (this information can be stored in the SIM or in the ME.) If subscriber has different MSISDN for different services, each MSISDN is returned in a separate line (<CR><LF>).

Defined values

<number>: string type; phone number

<alpha>:string type; optional alphanumeric string associated with <number>;used character set should be the one selected with command Select TE Character Set +CSCS.

<type>: integer value

129	National
145	International

Informative examples

-Initial the HyperTerminal

-Initial the MS

-AT Command

1.Power on MS but SIM is not ok

AT+CPIN?

+CME ERROR: 10

AT+CNUM

+CME ERROR: 10

2.Power on MS and SIM is ok

AT+CPIN?

+CPIN: READY

OK

AT+CNUM

+CNUM: “ABC”,”0920123456”,129

OK

Network registration +CREG

Table: +CREG parameter command syntax

Command	Possible response(s)
+CREG=[<n>]	+CME ERROR:<err>
+CREG?	+CREG: <n>,<stat>

©2004 BenQ Corporation. Confidential Property

	+CME ERROR:<err>
+CREG=?	+CREG: (list of supported <n>s)

Description

Set command controls the presentation of an unsolicited result code code +CREG: <stat>when <n>=1 or 2.

Read command returns the status of result code presentation and an integer <state> which shows whether the network has currently indicated the registration of the ME.

Test command returns a list of supported <n>.

Defined values

<n>:integer value

0 <default>	Disable network registration unsolicited result code.
1	Enable network registration unsolicited result code +CREG: <stat>.
2	Enable network registration and location information unsolicited result code +CREG: <stat>[,<lac>,<ci>]

<state>:integer value

0	Not registered, ME is not currently searching a new operator to register to (NO SERVICE)
1	Registered, home network
2	Limiting Service: not registered but ME is currently searching a new operator to register to
3	Limiting Service: registration denied
4	Unknown
5	Registered, roaming

Informative examples

-Initial the HyperTerminal

-Initial the MS

-AT Command

1. Disable network registration unsolicited result code

AT+CREG=0

OK

2. Enable network registration unsolicited result code
AT+CREG=1
OK

3.Returns the status of current network registration.
AT+CREG?
+CREG: 1,1
OK

4.Enable network registration and location information unsolicited result code
AT+CREG=2
OK
AT+CREG?
+CREG: 2, 5, 100F, 0000
OK

Operator selection +COPS

Table: +COPS parameter command syntax

Command	Possible response(s)
+COPS=[<mode>[,<format>[,<oper>]]]	+CME ERROR: <err>
+COPS?	+COPS: <mode>[,<format>,<oper>] +CME ERROR: <err>
+COPS=?	+COPS: [list of supported(<state>,[long alphanumeric<oper>], [short alphanumeric<oper>], numerica <oper>)s] [,,(list of supported <mode>s), (list of supported <format>s)] +CME ERROR: <err>

Description

1. Set command forces an attempt to select and register the GSM network operator. <mode> is used to select whether the selection is done automatically by the ME or is forced by this command to operator <oper>

2. Read command returns the current mode and the currently selected operator. If

no operator is selected, <format> and <oper> are omitted.

3. Test command returns a list of quadruplets, each representing an operator present in the network. Quadruplet consists of an integer indicating the availability of the operator <state>,long and short alphanumeric format of the name of the operator, and numeric format representation of the operator. Any of the formats may be unavailable and should then be an empty field. The list of operators shall be in order: home network, networks referenced in SIM, and other networks.

In addition, after the operator list, TA returns lists of supported <mode>s and <format>s delimited from the operator list by two commas.

Defined values

<mode>: integer value

0	Auto selection
1	Manual selection
3	Set only <format>,don't attempt registratio.<oper> shall be omitted.
4	Manual/automatic (<oper> fields shall be present);if manual selection fails, automatical mode (<mode>=0)is entered.

<format>: integer value

0	Long format alphanumeric <oper>
1	Short format alphanumeric <oper>
2	Numeric <oper>

<oper>:string type; numeric format is the GSM Location Area Identification number which consists of a three BCD digit country code coded as in ITU-T E.212 Annex A[10], plus a two BCD digit network code, which is administration specific; returned <oper> shall not be in BCD format, but in IRA characters converted from BCD; hence the number has structure: (country code digit3)(country code digit2)(country code digit1)(network code digit2)(network code digit1)

<state>: integer value

0	Unknown
1	Available
2	Current

©2004 BenQ Corporation. Confidential Property

3 Forbidden

Informative examples

-Initial the HyperTerminal

-Initial the MS

-AT Command

1.Automatic selection of network

AT+COPS=0

OK

AT+COPS?

+COPS: 0,0,"ROC LDTA GSM"

OK

2. List all available network and manual selection of network

AT+COPS=?

+COPS: (2,"ROC LDTA GSM","LDGSM","46692"), (3,"TWN GSM 1800","PCC","46697"),(1,"FarEasTone","FET","46601"),(3,"KGT-Online","KGT","46688")

OK

AT+COPS=1,2,”46601”

OK

Facility Lock AT+CLCK

Table: +CLCK parameter command syntax

Command	Possible response(s)
+CLCK=<fac>,<mode>[,<passwd>]	Right: OK **When <mode>=2 and command successful:** Right: +CLCK: <status>[,<class>] Wrong: +CME ERROR: <er>
+CLCK=?	+CLCK: (list of supported <fac>s) +CME ERROR: <err>

Description

Execution command is used to lock, unlock or interrogate a ME or a network facility <fac>. Password is normally needed to do such actions. When querying the

status of a network service (<mode>=2) the response line for ‘not active’ case (<status>=0) should be returned only if service is not active for any <class>. This command should be abortable when network facilities are set or interrogated.

Call barring facilities are based on GSM supplementary services. The interaction of these with other commands based on other GSM supplementary services is described in the GSM standard.

Test command returns facility values supported by the TA as compound value.

Defined Values

<fac>:

“SC”	PIN enabled (<mode>=1) / disabled (<mode> = 0)
“AO”	BAOC (Barr All Outgoing Calls)
“OI”	BOIC (Barr Outgoing International Calls)
“OX”	BOIC-exHC (Barr Outgoing International Calls except to Home Country)
“AI”	BAIC (Barr All Incoming Calls)
“IR”	BIC-Roam (Barr Incoming Calls when Roaming outside the home country)
“AB”	All Barring services
“AG”	All outgoing barring services
“AC”	All incoming barring services
“FD”	SIM fixed dialing Numbers (FDN) memory feature (if PIN2 authentication has not been done during the current session, PIN2 is required as <passwd>
“PS”	SIM personalization
“PN”	Network personalization of the ME
“PU”	Network subset personalization of the ME
“PP”	Service provider personalization of the ME
“PC”	Corporate personalization of the ME
“PF”	Personalization on first inserted SIM

<Mode>:

0	Unlock
1	Lock
2	Query status

©2004 BenQ Corporation. Confidential Property

<status>:

0	Not active
1	Active

<password>: string type, indicate PIN or network password

<class>: integer type, sum of integers each representing a class(default 7)

1	Voice
2	Data
4	Fax
8	Short message
16	Data circuit sync
32	Data circuit async
64	Dedicated packet access
128	Dedicated PAD access

Informative examples

-Initial the HyperTerminal

-Initial the MS

-AT Command

AT+CLCK=?

+CLCK:("SC","AO","OI","OX","AI","IR","AB","AG","AC","FD","PS","PN","PU","PP","PC","PF")

OK

1. Enable PIN with “1234”

AT+CLCK=”SC”,1,”1234”

OK

2. Disable PIN

AT+CLCK=”SC”,0,”1234”

OK

3. Query the PIN lock status

AT+CLCK=”SC”,2

+CLCK: 0

OK

4. Activate all outgoing calls barring

AT+CLCK=”AO”,1,”1234”

OK

5. Disable all outgoing calls barring

AT+CLCK=”AO”,0,”1234”
OK

Change password +CPWD

Table: +CPWD action command syntax

Command	Possible response(s)
+CPWD=<fac>, <oldpwd>, <newpwd>	+CME ERROR: <err>
+CPWD=?	+CPWD: list of supported (<fac>, <pwdlength>)s +CME ERROR: <err>

Description

Action command sets a new password for the facility lock function defined by command Facility Lock +CLCK.

Defined values

<fac>: “P2” SIM PIN2, refer Facility Lock +CLCK for other values

<oldpwd>, <newpwd>: string type; <oldpwd> shall be the same as password specified for the facility from the ME user interface or with command Change Password +CPWD and <newpwd> is the new password; maximum length of password can be determined with <pwdlength>

<pwdlength>: integer type maximum length of the password for the facility

Informative examples

-Initial the HyperTerminal
-Initial the MS
-AT Command

AT+CPWD=?
+CPWD:("SC",4),("AO",4),("OI",4),("OX",4),("AI",4),("IR",4),("AB",4),("AG",4),("AC",4),("P2",4)
OK

Calling line identification presentation +CLIP

Table: +CLIP parameter command syntax

Command	Possible response(s)
+CLIP=[<n>]	
+CLIP?	+CLIP: <n>, <m>
+CLIP=?	+CLIP:(list of supported <n>)

Description

This command enables a called subscriber to get the calling line identity (CLI) of the calling party when receiving a mobile terminated call.

Defined values

<n>: integer type, sets /shows the result code presentation status in TA

0 Disable

1 Enable

<m>: integer type, shows the subscriber CLIP service status in the network

0 CLIP not provisioned

1 CLIP provisioned

2 Unknown (e.g. no network, etc.)

Informative examples

-Initial the HyperTerminal

-Initial the MS

-AT Command

1. ACTIVATE

AT+CLIP=1

OK

AT+CLIP?

+CLIP: 1, 1

(As incoming call occurs, ms will display the unsolicited result code.)

RING

(1)+CLIP: "0920123456",129,"",,"APPLE",0 (AT+CSCS=”IRA”)

(2)+CLIP: "",128,,,,1

2. DEACTIVATE

AT+CLIP=0

OK

AT+CLIP?
+CLIP:0,1

3. INTERROGATION
AT+CLIP?
+CLIP: 0,1
OK

Call line identification restriction +CLIR

Table: +CLIR parameter command syntax

Command	Possible response(s)
+CLIR=[<n>]	
+CLIR?	+CLIR: <n>, <m>
+CLIR=?	+CLIR:(list of supported <n>)

Description

This command allows a calling subscriber to enable or disable the presentation of the CLI to the called party when originating a call. Set command overrides the CLIR subscription (default is restricted or allowed) when temporary mode is provisioned as a default adjustment for all following outgoing calls. This adjustment can be revoked by using the opposite command. Read command gives the default adjustment for all outgoing calls (given in <n>), and also triggers an interrogation of the provision status of the CLIR service (given in <m>). Test command returns values supported by the TA as a compound value.

Defined values

<n>: integer type, sets the adjustment for outgoing call

0	Presentation indicator is used according to CLIR service
1	CLIR invocation
2	CLIR suppression

<m>: integer type, shows the subscriber CLIR service status in the network

0	CLIR not provisioned
1	CLIR provisioned
2	Unknown (e.g. no network, etc.)
3	CLIR temporary mode presentation restricted
4	CLIR temporary mode presentation allowed

Note:
Temporary mode in make call request
ATD*31#<phone num>
CLIR suppression, the called party will receive the calling number.
ATD#31#<phone num>
CLIR invocation, the called party will not receive the calling number.

Informative examples

-Initial the HyperTerminal
-Initial the MS
-AT Command

1. DEACTIVATE
   AT+CLIR=2
   OK
   After the suppression of CLIR, the called party will receive the calling subscriber's phone number.

2. ACTIVATE
   AT+CLIR=1
   OK
   After invocation of the CLIR, the called party will not receive the calling subscriber's phone number.

3. INTERROGATION
   AT+CLIR?
   +CLIR: 0,4
   OK
   It means the current setting is according to the subscription of the CLIR service. And the service status in the network is "Temporary mode presentation allowed".

Connected line identification presentation +COLP

Table: +COLP parameter command syntax

Command	Possible response(s)
+COLP=[<n>]	

+COLP?	+COLP: <n>, <m>
+COLP=?	+COLP:(list of supported <n>s)

Description

This command enables a calling subscriber to get the connected line identity (COL) of the called party after setting up a mobile originated call. The command enables or disables the presentation of the COL at the TE. It has no effect on the execution of the supplementary service COLR in the network. This command is useful for call forwarding of the connected line.

When enabled (and called subscriber allows),
+COLP: <number>, <type>[, <subaddr>, <satype>[, <alpha>]] intermediate result code is returned from TA to TE before any +CR or V.25ter response. It is manufacturer specific if this response is used when normal voice call is established.

Read command gives the status of <n>, and also triggers an interrogation of the provision status of the COLP service (given in <m>).

Define values

<n>(parameter sets/shows the result code presentation status in the TA)

0	Disable
1	Enable

<m>(parameter shows the subscriber COLP service status in the network)

0	COLP not provisioned
1	COLP provisioned
2	Unknown (e.g. no network, etc.)

Informative examples

-Initial the HyperTerminal
-Initial the MS
-AT Command

AT+COLP=?
+COLP: (0,1)
OK

AT+COLP?
+COLP: 0,0
OK

AT+COLP=1
OK
ATD0920123456;
+COLP: ,255,,,"LIN"
OK

Closed user group +CCUG

Table: +CCUG parameter command syntax

Command	Possible response(s)
+CCUG=[<n>[, <index>[, <info>]]]	
+CCUG?	+CCUG: <n>,<index>, <info>

Description

This command allows control of the Closed User Group supplementary service. Set command enables the served subscriber to select a CUG index to suppress the Outgoing Access (OA), and to suppress the preferential CUG.

Define values

<N>

0	Disable CUG temporary mode
1	Enable CUG temporary mode

<Index>

0…9	CUG index
10	No index (preferred CUG taken from subscriber data.

<Info>

0	No information
1	Suppress OA
2	Suppress preferential CUG
3	Suppress OA and preferential CUG

Informative examples

-Initial the HyperTerminal
-Initial the MS

©2004 BenQ Corporation. Confidential Property

-AT Command

AT+CCUG=?
+CCUG: (0,1), (0-10), (0-3)
OK

AT+CCUG?
+CCUG: 0,0,0
OK

Call forwarding service +CCFC

Table: +CCFC parameter command syntax

Command	Possible response(s)
+CCFC =<reason>, <mode>[, <number>[, <type>[,<class>[,<subaddr>[, <satype>[, <time>]]]]]]	+CME ERROR: <err> When <mode> = 2 and command successful: +CCFC: <status>, <class1>[, <number>, <type>[,<subaddr>,<satype>[,<time>]]][<CR><LF>+CCFC: <status>, <class2>[, <number>, <type>[, <subaddr>, <satype>[, <time>]]] […]]
+CCFC=?	+CCFC: (list of supported <reason>s)

Description

This command allows control of the call forwarding supplementary service. Registration, erasure, activation, deactivation, and status query are supported.

Defined values

<Reason>:

0	Unconditional
1	Mobil busy
2	No Reply
3	Not reachable
4	All call forwarding
5	All conditional call forwarding

<Mode>:

0	Disable

1	Enable
2	Query Status
3	Registration
4	Erasure

<Class x>: integer type, sum of bearer service code.

1	Voice (telephony)
2	Data (refers to all bearer services; with <mode>=2 this may refer only to some bearer service if TA does not support values 16,32,64 and 128)
4	Fax (facsimile services)
8	Short message service
16	Data circuit sync
32	Data circuit async
64	Dedicated packet access
128	Dedicated PAD access

<number>: string type, forwarding phone number.
<type>: type of address octet in integer format; default 145 when dialing string includes international access code character "+", otherwise 129

<subaddr>: string type subaddress of format specified by <satype>
<satype>: type of subaddress octet in integer format; default 128
<Time>: 1…30 when "no reply" is enabled or queried, this gives the time in seconds to wait before call is forwarded, default value 20
<Status>:

0	Not active
1	Active

Informative examples

-Initial the HyperTerminal
-Initial the MS
-AT Command

1. Query status
   AT+CCFC=0,2
   Query the status of unconditional forwarding
   +CCFC: 0,1

Interrogated result: not active, voice
OK

2. Registration
   Before enable, disable, and erasure, you should register the SS service.
   AT+CCFC=0,3,"0123456789"
   Register unconditional forwarding to "0123456789" and activated the service.
   OK
   It doesn't means that the SS service is registered successfully. You should query the status to confirm the result.

3. Deactivate
   AT+CCFC=0,0
   Disable unconditional forwarding.
   OK

4. Activate
   AT+CCFC=0,1
   Enable unconditional forwarding.

5. Erasure
   AT+CCFC=0,4
   Erase registered unconditional forwarding data.

Note: After registering unconditional call forwarding, one can't register another reason's service.

Call waiting service +CCWA

Table: +CCWA parameter command syntax

Command	Possible response(s)
+CCWA =[<n>[, <mode>[, <class>]]]	+CME ERROR: <err> When <mode> = 2 and command successful +CCWA: <status>,<class1>[<CR><LF>+CCWA: <status>, <class2>[…]]
+CCWA?	+CCWA: <n>
+CCWA=?	+CCWA: (list of supported <n>s)

Description

This command allows control of the Call Waiting supplementary service. Activation, deactivation and status query are supported. When querying the status of a network service (<mode>=2) the response line for 'not active' case (<status>=0) should be returned only if services not active for any <class>. Parameter <n> is used to disable/enable the presentation of an unsolicited result code +CCWA: <number>, <type>, <class>,[<alpha>][,<CLI validity>] to the TE when call waiting service is enabled. Command should be abortable when network is interrogated.

Defined values

<N>: integer type (sets/shows the unsolicited result code presentation status in the TA),

.

0	Disable
1	Enable

<Mode>: integer type, operation mode of

0	Disable
1	Enable
2	Query status

<Status>: integer type, CCWA status.

0	Not active
1	Active

<Class>: is a sum of integers each representing a class of information

1	Voice
2	Data (refers to all bearer services; with <mode>=2 this may refer only to some bearer service if TA does not support values 16,32,64 and 128)
4	Fax (facsimile services)
8	Short message service
16	Data circuit sync
32	Data circuit async
64	Dedicated packet access
128	Dedicated PAD access

<Number>: string type phone number of calling address in format specified by

©2004 BenQ Corporation. Confidential Property

<type>

<Type>: type of address octet in integer format

<Alpha>:optional string type alphanumeric representation of <number> corresponding to the entry found in phonebook.

<CLI validity>:

0	CLI valid
1	CLI has been withheld by the originator.
2	CLI is not available due to interworking problems or limitations of originating network.

Informative examples

-Initial the HyperTerminal

-Initial the MS

-AT Command

1. ACTIVATION

   AT+CCWA=0,1

   OK

2. DEAACTIVATION

   AT+CCWA=0,0

   OK

   AT+CCWA=1

   ATD0952123456;

   OK

   (Another call is coming)

   +CCWA: , 161,1,,1

3. INTERROGATION

   AT+CCWA=0,2

   Case 1: if the call waiting is active, echo

   +CCWA: 1,1

   Case 2: if operation success and call waiting is not active, echo

   +CCWA: 0,1

   Case 3: if operation success and network not support, echo

   ERROR

Short string procedure AT+CHLD

Table: +CHLD parameter command syntax

Command	Possible response(s)
+CHLD =[<n>]	+CME ERROR <err>
+CHLD=?	[+CHLD: (list of supported <n>s)

Description

This command allows the control of the following call related services:

- a call can be temporarily disconnected from the ME but the connection is retained by the network;
- Multiparty conversation (conference calls);
- The served subscriber who has two calls (one held and the other either active or alerting) can connect the other parties and release the served subscriber's own connection.

Calls can be put on hold, recovered, released, added to conversation, and transferred similarly.

It is recommended (although optional) that test command returns a list of operations which are supported. The call number required by some operations shall be denoted by "x" (e.g. `+CHLD: (0,1,1x,2,2x,3)`).

Defined values

1. **AT+CHLD=0**
   Release all held calls or send UDUB for a waiting call.
2. **AT+CHLD=1**
   Release all active calls and accept the other held or waiting calls.
3. **AT+CHLD=1x**
   Release a specified active call x.
4. **AT+CHLD=2**
   Place all active calls on hold and accept the other waiting or held calls.
5. **AT+CHLD=2x**
   Place all active calls on hold except call x with which communication shall be supported.
6. **AT+CHLD=3**
   Adds held calls to the conversation.
7. **AT+CHLD=4**

©2004 BenQ Corporation. Confidential Property

Connects the two calls and disconnects the subscriber from both calls.

Informative examples

-Initial the HyperTerminal

-Initial the MS

-AT Command

(1)

;;;;;;MO1<Test Module> makes a call to MT1

ATD0921214863;

OK

;;;;;;MT1 accepts the call from MO1

AT+CHLD=2

OK

;;;;;;MO2 makes a call to MO1

;;;;;;MO1 accepts the call from MO2

Ring

ATA

AT+CHLD=1

OK

;;;;;;MO1-MO2 breaks.

(2)

;;;;;;MO1<Test Module> makes a call to MT1

ATD0921214863;

OK

;;;;;;MT1 accepts the call from MO1

AT+CHLD=2

OK

;;;;;;MO2 makes a call to MO1

;;;;;;MO1 accepts the call from MO2

Ring

ATA

AT+CHLD=4

OK

;;;;;;Both calls break.

©2004 BenQ Corporation. Confidential Property

Unstructured supplementary service data +CUSD

Table: +CUSD parameter command syntax

Command	Possible response(s)
+CUSD=[<n>[, <str>[, <dcs>]]]	+CME ERROR: <err>
+CUSD?	+CUSD: <n>
+CUSD=?	+CUSD: (list of supported <n>s)

Description

This command allows control of the Unstructured Supplementary Service Data (USSD). Both network and mobile initiated operations are supported. Parameter <n> is used to disable/enable the presentation of an unsolicited result code (USSD response from the network, or network initiated operation) +CUSD: <m>[, <str>, <dcs>] to the TE. In addition, value <n>=2 is used to cancel an ongoing USSD session.

When <str> is given, a mobile initiated USSD-string or a response USSD-string to a network initiated operation is sent to the network. The response USSD-string from the network is returned in a subsequent unsolicited +CUSD result code.

Test command returns values supported by the TA as a compound value.

Defined values

<N>

0	Disable the result code presentation in the TA
1	Enable the result code presentation in the TA
2	Cancel session (not applicable to read command response)

<str>: string type USSD-string(when <str> parameter is not given, network is not interrogated).

<dcs>: Cell Broadcast Data Coding Scheme in integer format.

<M>

0	no further user action required
1	further user action required.
2	USSD terminated by network
3	Other local client has responded
4	Operation not supported
5	Network time out

©2004 BenQ Corporation. Confidential Property

Informative examples

-Initial the HyperTerminal

-Initial the MS

-AT Command

AT+CUSD=?

+CUSD: (0,1,2)

OK

AT+CUSD?

+CUSD: 0

OK

AT+CUSD=1

OK

(Far Eastone SIM)

AT+CUSD=1,"*147#",15

+CUSD: 0,"Accepted",0

OK

Advice of Charge +CAOC

Table: +CAOC parameter command syntax

Command	Possible response(s)
+CAOC=[<mode>]	[+CAOC: <ccm>] +CME ERROR: <err>
+CAOC?	+CAOC: <mode>
+CAOC=?	[+CAOC: (list of supported <mode>s)]

Description

This refers to Advice of Charge supplementary service that enables subscriber to get information about the cost of calls. With <mode>=0, the execute command returns the current call meter value from the ME.

The command also includes the possibility to enable an unsolicited event reporting of the CCM information. The unsolicited result code +CCCM: <ccm> is sent when

the CCM value changes, but not more that every 10 seconds. Deactivation of the unsolicited event reporting is made with the same command.

The Read command indicates whether the unsolicited reporting is activated or not. Read command is available when the unsolicited result code is supported.

Defined values

<Mode>

0	Query CCM value
1	Deactivate the unsolicited reporting of CCM value
2	Activate the unsolicited reporting of CCM value

<ccm>: string type; three bytes of the current call meter value in hexadecimal format.

Informative examples

-Initial the HyperTerminal

-Initial the MS

-AT Command

AT+CAOC
+CAOC: "000000"
OK

AT+CAOC?
+CAOC: 1
OK

AT+CAOC=?
+CAOC: (0-2)
OK

Supplementary service notifications +CSSN

Table: +CSSN parameter command syntax

Command	Possible response(s)
+CSSN=[<n>[, <m>]]	
+CSSN?	+CSSN: <n>, <m>
+CSSN=?	+CSSN: (list of supported <n>s), (list of supported

©2004 BenQ Corporation. Confidential Property

	<m>s)

Description

This command refers to supplementary service related network initiated notifications. The set command enables/disables the presentation of notification result codes from TA to TE.

When <n>=1 and a supplementary service notification is received after a mobile originated call setup, intermediate result code +CSSI: <code1>[,<index>] is sent to TE before any other MO call setup result codes presented in the present document or in V.25ter. When several different <code1>s are received from the network, each of them shall have its own +CSSI result code.
When <m>=1 and a supplementary service notification is received during a mobile terminated call setup or during a call, or when a forward check supplementary service notification is received, unsolicited result code +CSSU: <code2>[,<index>[,<number>,<type>]]] is sent to TE. In case of MT call setup, result code is sent after every +CLIP result code (refer command "Calling line identification presentation +CLIP") and when several different <code2>s are received from the network, each of them shall have its own +CSSU result code.

Test command returns values supported by the TA as a compound value.

Defined values

<N>(parameter sets/shows the +CSSI result code presentation status)

0	Disable
1	Enable

<M>(parameter sets/shows the +CSSU result code presentation status)

0	Disable
1	Enable

<Code1>

0	Unconditional call forwarding is active
1	Some of the conditional call forwardings are active
2	Call has been forwarded
3	Call is waiting
4	This is a CUG call
5	Outgoing calls are barred
6	Incoming calls are barred
7	CLIR suppression rejected

8	Call has been deflected

<Index>: refer "Closed user group+CCUG"

<Code2>

0	This is a forwarded call
1	This is a CUG call
2	Call has been put on hold
3	Call has been retrieved
4	Multiparty call entered
5	Call on hold has been released
6	Forward check SS message received
7	Call is being connected with the remote party in alerting state in explicit call transfer operation
8	Call has been connected with the other remote party I explicit call transfer operation
9	This is a deflected call
10	Additional incoming call forwarded

<Number>: string type phone number

<Type>: type of address octet in integer format

<subaddr>: string type subaddress

<satype>: type of subaddress octet in integer format

Informative example

-Initial the HyperTerminal

-Initial the MS

-AT Command

AT+CSSN=?

+CSSN: (0,1),(0,1)

OK

AT+CSSN?

+CSSN: 0,0

OK

AT+CSSN=1,1

OK

AT+CSSN?

+CSSN: 1,1

OK

at+cssn=1,1
OK
atd0937135753; // This phone number is “call forward” to another phone
OK

+CSSI: 1

NO CARRIER

OK

Preferred PLMN list +CPOL

Table: +CPOL parameter command syntax

Command	Possible response(s)
+CPOL=[<index>][,<format>[,<oper>]]	+CME ERROR: <err>
+CPOL?	+CPOL: <index1>,<format>,<oper1>[<CR><LF>+CPOL:<index2>,<format>,<oper2> [...]] +CME ERROR: <err>
+CPOL=?	+CPOL: (list of supported <index>s), (list of supported <format>s) +CME ERROR: <err>

Description

This command is used to edit the PLMN selector with Access Technology lists in the SIM card or active application in the UICC(GSM or USIM).

Execute command writes an entry in the SIM/USIM list of preferred PLMNs, previously selected by the command +CPLS. If no list has been previously selected, the User controlled PLMN selector with Access Technology, $EF_{OPLMNWACT}$, is the one accessed by default. If <index> is given but <oper> is left out, entry is deleted. If <oper> is given but <index> is left out, <oper> is put in the next free location. If only <format> is given, the format of the <oper> in the read command is changed. The Access Technology selection parameters, Read command returns all used entries from the SIM/USIM list of preferred PLMNs, previously selected by the command +CPLS, with the Access Technologies for each PLMN in the list.

Note: It is recommend to add a preferred PLMN with numeric format. There is an internal list which store all PLMN's long name, short name and numeric name in the module. AT+COPN shows the list. The numeric information is the MCC and MNC of the PLMN. When using long/short format to add a preferred PLMN that does not exist in the internal list, the module will reject the command because the module is fail to get the MCC and MNC of the PLMN.

Test command returns the whole index range supported by the SIM.

Defined values

<indexn>: integer type; the order number of operator in the SIM/USIM preferred operator list

<format>

0	Long format alphanumeric<oper>
1	Short format alphanumeric<oper>
2	Numeric<oper>

<opern>: string type; <format> indicates if the format is alphanumeric or numeric

Informative examples

-Initial the HyperTerminal

-Initial the MS

-AT Command

AT+CPOL=?

+CPOL: (1-8), (0-2)

OK

AT+CPOL?

+CPOL:1,2,"46697"

OK

List current calls +CLCC

Table: +CLCC parameter command syntax

Command	Possible response(s)
+CLCC	+CLCC: <id1>, <dir>, <state>, <mode>, <mpty>[, <number>, <type>[, <alpha>]]….

©2004 BenQ Corporation. Confidential Property

	+CLCC: 0

Description

Returns list of current calls of ME. If command succeeds but no calls are available, no information response is sent to TE.

Defined values

<Id>: call id which is a digit from 1 to 7

<Dir>: integer type

0	Mobile originated (MO) call
1	Mobile terminated (MT) call

<State>:(state of the call)

0	Active
1	Held
2	Dialing (MO call)
3	Alerting (MO call)
4	Incoming (Mt call)
5	Waiting (MT call)

<Mode>:(bearer/teleservice)

0	Voice
1	Data
2	Fax
3	Voice followed by data, voice mode
4	Alternating voice/data, voice mode
5	Alternating voice/fax, voice mode
6	Voice followed by data, data mode
7	Alternating voice/data, data mode
8	Alternating voice/fax, fax mode
9	Unknown

<mpty>: integer type

0	Call is not one of multiparty (conference) call parties
1	Call is one of multiparty (conference) call parties

<Number>: string type phone number

<Type>: type of address octet in integer format

<Alpha>: string type alphanumeric representation of <number> corresponding to the entry found in phonebook; used character set should be the one selected with

command +CSCS

Informative example

-Initial the HyperTerminal
-Initial the MS
-AT Command

ATD0952123456;
OK
AT+CLCC
+CLCC: 1,0,0,0,0,"0952123456",129,"aa"

Read operator names +COPN

Table: +COPN parameter command syntax

Command	Possible response(s)
+COPN	+COPN: <numeric1>,<alpha1>[<CR><LF>+COPN: <numeric2>,<alpha2>[…]] +CME ERROR: <err>

Description

Execute command returns the list of operator names from the ME. Each operator code<numericn> that has an alphanumeric equivalent <alphan> in the ME memory shall be returned.

Defined values

<numericn>: string type; operator in numeric format(see +COPS)
<alphan>: string type; operator in long alphanumeric format(see +COPS)

Informative example

-Initial the HyperTerminal
-Initial the MS
-AT Command

AT+COPN
+COPN: "00131","Test Network"
+COPN: "546559","Test Net 222"

©2004 BenQ Corporation. Confidential Property

+COPN: "56231","A1"
+COPN: "56263","A max."
……
OK

Get neighbor cells +GNC

Table: +GNC parameter command syntax

Command	Possible response(s)
+GNC	+GNC: list of possible <ncid>s

Description
This command is used to get the identity of the neighbor cells. The maximum number of neighbor cells is up to 6.

If any neighbor cell exists,
+GNC: <ncid1>[, <ncid2>[ ]…]

if there is no any neighbor cell,
+GNC:
<ncid>: string type; two byte cell ID in hexadecimal format

Informative example
AT+GNC?
+GNC: 4ecc, 3c7d, 959f, 763a, 8a9d
OK

2.1.4 Mobile control and status commands

Phone activity status +CPAS

Table: +CPAS parameter command syntax

Command	Possible response(s)
+CPAS	+CPAS: <pas> +CME ERROR: <err>
+CPAS=?	+CPAS: (list of supported <pas>s) +CME ERROR: <err>

Description
Execution command returns the activity status <pas> of the ME. It can be used to interrogate the ME before requesting action from the phone.

Defined values

<pas>

0	Ready
1	Unavailable
2	Unknown
3	Ringing
4	Call in progress
5	Asleep

Informative example

-Initial the HyperTerminal

-Initial the MS

-AT Command

AT+CPAS=?

+CPAS: (0-5)

OK

AT+CPAS

+CPAS: 0

OK

Set phone functionality +CFUN

Table: +CFUN parameter command syntax

Command	Possible response(s)
+CFUN=[<fun>[,<rst>]]	+CME ERROR: <err>
+CFUN?	+CFUN: <fun> CME ERROR: <err>
+CFUN=?	+CFUN: (list of supported <fun>s),(list of supported <rst>s) +CME ERROR: <err>

Description

Set command selects the level of functionality <fun> in the ME. Level "full functionality" is where the highest level of power is drawn. "Minimum functionality" is where minimum power is drawn. Level of functionality between these may also be specified by manufacturers. When supported by manufactured, ME resetting

©2004 BenQ Corporation. Confidential Property

with <rst> parameter may be utilized.

Defined values

<fun>

0	Minimum functionality
1	Full functionality
4	Disable phone both transmit and receive RF circuits

<rst>

0: do not reset the ME before setting it to <fun> power level.

Informative examples

-Initial the HyperTerminal

-Initial the MS

-AT Command

AT+CFUN=?
+CFUN: (0,1,4),(0)
OK

AT+CFUN?
+CFUN: 0
OK

AT+CFUN=1
OK

AT+CFUN=4
OK

(SIM not inserted)
AT+CFUN?
+CFUN: 0
OK

AT+CFUN=1
ERROR
AT+CFUN?
+CFUN: 1

OK

Enter PIN +CPIN

Table: +CPIN parameter command syntax

Command	Possible response(s)
+CPIN=<pin>[, <newpin>]	+CME ERROR: <err>
+CPIN?	+CPIN: <code> +CME ERROR: <err>

Description

Set command sends to the MS a password that is necessary before it can be operated only SIM PIN. If no PIN request is pending, no action is taken. If SIM is useless or SIM is not inserted, an error message +CME ERROR, is returned to the TE.

Read command returns an alphanumeric string indicating whether some password is required or not.

Defined values

<pin>, <newpin>:string type values

<code>: values reserved by the present document

READY	ME is not pending for any password
SIM PIN	ME is waiting SIM PIN to be given
SIM PIN2	ME is waiting SIM PIN2 to be given (this <code> is recommended to be returned only when the last executed command resulted in PIN2 authentication failure (i.e. +CME ERROR: 17); if PIN2 is not entered right after the failure, it is recommended that ME does not block it operation)
SIM PUK	ME is waiting SIM PUK to be given
SIM PUK2	ME is waiting SIM PUK2 to be given (this <code> is recommended to be returned only when the last executed command resulted in PUK2 authentication failure (i.e. +CME ERROR: 18); if PUK2 and new PIN2are not entered right after the failure, it is recommended that ME does not block it operation)

Informative examples

-Initial the HyperTerminal

-Initial the MS

-AT Command

1. Power on (1) (CHV1 is disabled, SIM is ready)

AT+CPIN?

+CPIN: READY

2. Power on (1) (SIM not inserted)

AT+CMEE=2

OK

AT+CPIN?

+CME ERROR: SIM not inserted

Battery charge +CBC

Table: +CBC parameter command syntax

Command	Possible response(s)
+CBC	+CBC: <bcs>, <bcl> +CME ERROR: <err>
+CBC=?	+CBC: (list of supported <bcs>s), (list of supported <bcl>s)

Description

Execution command returns battery connection status <bcs> and battery charge level <bcl> of the ME.

Defined values

<bcs>

0	ME is powered by the battery
1	ME has a battery connected, but is not powered by it
2	ME does not have a battery connected
3	Recognized power fault, calls inhibited

<bcl>

0	Battery is exhausted, or ME does not have a battery connected
1…100	Battery has 1-100 percent of capacity remaining

Informative example

-Initial the HyperTerminal

-Initial the MS

-AT Command

AT+CBC=?

+CBC: (0-3),(0-100)

OK

Signal quality +CSQ

Table: +CSQ parameter command syntax

Command	Possible response(s)
+CSQ	+CSQ: <rssi>,<ber> +CME ERROR:<err>
+CSQ=?	+CSQ: (list of supported <rssi>s), (list of supported <ber>s)

Description

1. Execution command returns received signal strength indication <rssi> and channel bit error rate <ber> from the MS.

2. Test command returns values supported by the MS as compound values.

Only support continuous unsolicited response.

Defined values

<rssi>:

0	-113dBm or less
1	-111dBm
2…30	-109dBm ~ -53dBm
31	-51dBm or greater
99	Not known or not detectable

<ber>:

99	Unknown or not detectable

Informative examples

-Initial the HyperTerminal

-Initial the MS

©2004 BenQ Corporation. Confidential Property

-AT Command

AT+CSQ=?
+CSQ: (2-31,99), (99)
OK

AT+CSQ
+CSQ: 31, 99
OK

Restricted SIM access +CRSM

Table: +CRSM action command syntax

Command	Possible response(s)
+CRSM=<command>[,<fileid>[,<P1>,<P2>,<P3>[,<data>]]]	+CRSM:<sw1>,<sw2>[,<response>]+*CME ERROR: <err>*
+CRSM=?	

Description

By using this command instead of Generic SIM Access +CSIM TE application has easier but more limited access to the SIM database. Set command transmits to the ME the SIM <command> and its required parameters. ME handles internally all SIM-ME interface locking and file selection routines. As response to the command, ME sends the actual SIM information parameters and response data. ME error result code +CME ERROR may be returned when the command cannot be passed to the SIM, but failure in the execution of the command in the SIM is reported in <sw1> and <sw2> parameters.

Coordination of command requests to SIM and the ones issued by GSM/UMTS application inside the ME is implementation dependent. However the TE should be aware of the precedence of the GSM/UMTS application commands to the TE commands.

Defined values

<command> (command passed on by the ME to the SIM):

176 READ BINARY

178 READ RECORD

192 GET RESPONSE

214 UPDATE BINARY
220 UPDATE RECORD
242 STATUS
all other values are reserved

NOTE 1: The ME internally executes all commands necessary for selecting the desired file, before performing the actual command.

<fileid>: integer type; this is the identifier of a elementary datafile on SIM. Mandatory for every command except STATUS

NOTE 2: The range of valid file identifiers depends on the actual SIM and is defined in GSM 51.011 [28]. Optional files may not be present at all.

<P1>, <P2>, <P3>: integer type; parameters passed on by the ME to the SIM. These parameters are mandatory for every command, except GET RESPONSE and STATUS. The values are described in GSM 51.011 [28]

<data>: information which shall be written to the SIM (hexadecimal character format; refer +CSCS)

<sw1>, <sw2>: integer type; information from the SIM about the execution of the actual command. These parameters are delivered to the TE in both cases, on successful or failed execution of the command

<response>: response of a successful completion of the command previously issued (hexadecimal character format; refer +CSCS). STATUS and GET RESPONSE return data, which gives information about the current elementary datafield. This information includes the type of file and its size (refer GSM 51.011 [28]). After READ BINARY or READ RECORD command the requested data will be returned. <response> is not returned after a successful UPDATE BINARY or UPDATE RECORD command

Informative example

-Initial the HyperTerminal
-Initial the MS
-AT Command
AT+CRSM=192,12258,0,0,255

©2004 BenQ Corporation. Confidential Property

+CRSM: 103,15
OK

Ringer sound level and ringer type select +CRSL

Table: +CRSL parameter command syntax

Command	Possible response(s)
+CRSL = <level >	+CME ERROR: <err>
+CRSL?	+CRSL: <level >
+CRSL=?	+CRSL: (list of supported <level >)

Description

1. This command is used to select the incoming call ringer sound volume level of the ME.
2. Read command reads the current setting of ringer sound level.
3. Test command returns supported values as compound value.
4. For TI driver, the valid range of setting is 0 ~ 63. If the setting is larger than 63, then the ring volume is the same as 63.
5. The setting will not be stored. After power cycle, the setting will restore to default value “175”.

Defined values

<level>: integer type;

0-255	Ring sound level; 0:lowest gain, 255:highest gain

Informative examples

-Initial the HyperTerminal
-Initial the MS
-AT Command
AT+CRSL=?
+CRSL: (0-255)
OK

AT+CRSL?
+CRSL: 175
OK

©2004 BenQ Corporation. Confidential Property

Loudspeaker volume level +CLVL

Table: +CLVL parameter command syntax

Command	Possible response(s)
+CLVL = <level >	+CME ERROR:<err>
+CLVL?	+CLVL: <level >
+CLVL=?	+CLVL: (list of <level >s)

Description

1. Set command is used to select the volume of the internal loudspeaker of the ME.
2. Read command reads the setting value of loudspeaker volume.
3. Test command returns supported values as compound value.

Defined values

<level> : integer type; the value of sound volume

0-255 0 for lowest gain, 255 for highest gain

Informative examples

-Initial the HyperTerminal

-Initial the MS

-AT Command

AT+CLVL=?

+CLVL: (0-255)

OK

AT+CLVL?

+CLVL: 175

OK

AT+CLVL=258

ERROR

Mute +CMUT

Table: +CMUT parameter command syntax

Command	Possible response(s)
+CMUT = <n>	+CME ERROR:<err>

©2004 BenQ Corporation. Confidential Property

+CMUT?	+CMUT:<n >
+CMUT=?	+CMUT: (list of supported <n >S)

Description

1. This command is used to enable and disable the uplink voice muting during a voice call.
2. Read the current mode is mute on or mute off.
3. Test command returns supported values as compound value.

Defined values

<n> : integer type;

0	MUTE OFF
1	MUTE ON

Informative examples

-Initial the HyperTerminal
-Initial the MS
-AT Command

1. Set command
AT+CMUT=1
OK

2. Set command
AT+CMUT=3
ERROR

3. Read command
AT+CMUT?
+CMUT:0
OK

4. Test command
AT+CMUT=?
+CMUT: (0,1)
OK

Accumulated call meter +CACM

Table: +CACM parameter command syntax

Command	Possible response(s)
+CACM =[<passed>]	+CME ERROR: <err>
+CACM?	+CACM: <acm> +CME ERROR: <err>

Description

Set command resets the Advice of Charge related accumulated call meter value in SIM card or in the active application in the UICC file EF_{ACM}. ACM contains the total number of home units for both the current and preceding calls. SIM PIN2 is usually required to reset the value.

Defined values

<passwd> : string type; SIM PIN2

<acm>: string type

Informative example

-Initial the HyperTerminal

-Initial the MS

-AT Command

AT+CACM?

+CACM: "000000"

OK

Accumulated call meter maximum +CAMM

Table: +CAMM parameter command syntax

Command	Possible response(s)
+CAMM =[<passed>]	+CME ERROR: <err>
+CAMM?	+CAMM: <acm> +CME ERROR: <err>

Description

Set command sets the Advice of Charge related accumulated call meter maximum value in SIM card or in the active application in the UICC file EF_{ACMmax}. ACMmax contains the maximum number oh home units allowed to be consumed by the subscriber.

©2004 BenQ Corporation. Confidential Property

Defined values

<acmmax>: string type

<passed>: string type: SIM PIN2

Informative examples

-Initial the HyperTerminal

-Initial the MS

-AT Command

AT+CAMM?

+CAMM: "000000"

OK

Price per unit and currency table +CPUC

Table: +CPUC parameter command syntax

Command	Possible response(s)
+CPUC=[<currency>, <ppu>,<passed>]	+CME ERROR: <err>
+CPUC?	+CPUC: <currency>, <ppu> +CME ERROR: <err>

Description

Set command sets the parameters of Advice of Charge related price per unit and currency table in SIM card or in the active application in the UICC file EF_{PUCT}.PUCT information can be used to convert the home units into currency units. SIM PIN2 is usually required to set the parameters.

Defined values

<currency>: string type; three character currency code; character set as specified by command select TE Character Set

<ppu>: string type: price per unit; dot is used as a decimal separator.

Informative example

-Initial the HyperTerminal

-Initial the MS

-AT Command

AT+CPUC?

+CPUC: "","""
OK
AT+CPUC="NT","5.00"
+CME ERROR: SIM PIN2 required

Call Meter maximum event +CCWE

Table: +CCWE parameter command syntax

Command	Possible response(s)
+CCWE=<mode>	+CME ERROR: <err>
+CCWE?	+CCWE: <mode> +CME ERROR: <err>
+CCWE=?	+CCWE: (list of supported <mode>s) +CME ERROR: <err>

Description

Shortly before the ACM (Accumulated Call Meter) maximum value is reached, an unsolicited result code +CCWV will be sent, if enabled by this command. The warning is issued approximately when 30 seconds call time remains. It is also issued when starting a call if less than 30 s call time remains. If setting fails in an ME error, `+CME ERROR: <err>` is returned. Read command returns the current setting.

Test command returns supported settings.

Defined values

<mode>:

0 Disable the call meter warning event

1 Enable the call meter warning event

Informative examples

-Initial the HyperTerminal
-Initial the MS
-AT Command
AT+CCWE=?
+CCWE: (0,1)
OK

©2004 BenQ Corporation. Confidential Property

Set Voice Mail Number +CSVM

Table: +CSVM parameter command syntax

Command	Possible response(s)
+CSVM=<mode>[,<number>[,<type>]]	+CME ERROR: <err>
+CSVM?	+CSVM:<mode>,<number>,<type> +CME ERROR: <err>
+CSVM=?	+CSVM: (list of supported <mode>s), (list of supported <type>s) +CME ERROR: <err>

Description

The number to the voice mail server is set with this command. The parameters <number> and <type> can be left out if the parameter <mode> is set to 0. If setting fails, an ME error, `+CME ERROR: <err>` is returned.

Read command returns the currently selected voice mail number and the status (i.e. enabled/disabled).

Test command returns supported <mode>s and <type>s.

Defined values

<mode>:

0 Disable the voice mail number.

1 Enable the voice mail number.

<number>: string type; Character string <0..9,+>, the maximum length of phone number is 40 digits (include prefix '+' if exists)

<type>: integer type; Type of address octet.

129 ISDN / telephony numbering plan, national / international unknown

145 ISDN / telephony numbering plan, international number

161 ISDN / telephony numbering plan, national number

©2004 BenQ Corporation. Confidential Property

128 - 255 Other values refer TS 24.008 section 10.5.4.7

<type>: type of address octet in integer format (refer TS 24.008 [8] sub clause 10.5.4.7); default 145 when dialing string includes international access code character "+", otherwise 129.

Informative examples

-Initial the HyperTerminal
-Initial the MS
-AT Command
AT+CSVM=?
+CSVM: (0,1),(129,145,161)
OK

AT+CSVM?
+CSVM: 1,"188",129
OK

List all available AT commands +CLAC

Table: +CLAC parameter command syntax

Command	Possible response(s)
+CLAC	<AT Command1>[<CR><LF><AT Command2>[…]] +CME ERROR: <err>
+CLAC?	+CME ERROR: <err>

Description

Execution command causes the ME to return one or more lines of AT Commands.
Note: This command only returns the AT commands that are available for the user.

Defined values

<AT Command>: Defines the AT command including the prefix AT. Test shall not contain the sequence 0<CR> or OK<CR>

Informative example

-Initial the HyperTerminal
-Initial the MS

©2004 BenQ Corporation. Confidential Property

-AT Command
AT+CLAC
AT+CACM
AT+CAMM
AT+CAOC
……
OK

2.1.5 Commands related with phonebook service

Select phonebook memory storage +CPBS

Table: +CPBS parameter command syntax

Command	Possible response(s)
+CPBS=<storage>	+CME ERROR: <err>
+CPBS?	+CPBS: <storage>[,<used>,<total>] +CME ERROR: <err>
+CPBS=?	+CPBS: (list of supported <storage>s)

Description

1. Set command selects phonebook memory storage <storage> which is used by other phonebook commands. If settings fails in an MS error, +CME ERROR: <err> is returned.
2. Read command returns currently selected memory, this used entry numbers and the entire entry numbers in the selected storage.
3. Test command returns supported storages as compound value.

Defined values

<storage>:string type

"EN"	SIM/USIM (or ME) emergency number(+CPBW is not be applicable for this storage)
"FD"	SIM fix dialing-phonebook
"DC"	MTdialled calls list (+CPBW may not be applicable for this storage)
"LD"	SIM/UICC last dialing phonebook
"RC"	Last received umbers
"SM"	Abbreviated dialing numbers
"MC"	Last missed number
"ON"	Own number

©2004 BenQ Corporation. Confidential Property

<used>: the used entry numbers within the selected storage.
<total>: the all entry numbers within the selected storage.

Informative examples

-Initial the HyperTerminal
-Initial the MS
-AT Command

1. Set command

AT+CPBS=”DC”
OK

1. Read command

AT+CBPS?
+CPBS: "SM",17,100
OK

2. Test command

AT+CPBS=?
+CPBS: ("EN","FD","DC","RC","SM","MC","ON)
OK

Read phonebook entries +CPBR

Table: +CPBR parameter command syntax

Command	Possible response(s)
+CPBR=<index1>[,<index2>]	[+CPBR: <index1>,<number>,<type>,<text>[[..]<CR><LF>+CPBR: <index2>,<number>,<type>,<text>]] +CME ERROR:<err>
+CPBR=?	+CPBR: (list of supported <index>s), [<nlength>], [<tlength>] +CME ERROR:<err>

Description

1. Execution command returns phonebook entries in location number range <index1>..<index2> from the current phonebook memory storage selected with +CPBS. If <index2> is left out, only location <index1> is returned. Entry fields

returned are location number <indexn>, phone number stored there <number>(of format <type>) and text <text> associated with the number. If all queried locations are empty (but available), no information text lines may be returned and +CME ERROR: <err> can be returned. If list setting fails in an ME error, +CME ERROR: <err> is returned.

2. If it is possible to show Chinese name in phone book, character set (+CSCS) has better to set "UCS2" first.

Defined values

<index1>,<index2>: integer type value in the range of location numbers of phonebook memory.

<number>: string type indicating the phone number of format <type>

<type>: integer value indicating type of address octet in integer format.

<text>: string type ;character set specified by command select TE character Set +CSCS(details pls refer to Appendix)

<nlength>: integer value indicating the maximum length of field <number>

<tlength>: integer value indicating the maximum length of field <text>

Informative examples

-Initial the HyperTerminal

-Initial the MS

-AT Command

1. Read the phonebook from index1 to index2 and neglect the blank record.

```
AT+CPBS="SM"
OK
AT+CPBR=1,5
+CPBR:1,"27998800",129,"David"
+CPBR:3,"27998800",129,"JENNY"
+CPBR:5,"27998800",129,"Davis"
OK
```

2. Chinese name may appear in phone book (SM).

```
AT+CSCS="UCS2"
OK
AT+CPBR=61,70
+CPBR: 61,"0920960846",129,"004D00410047"
+CPBR: 62,"0928844716",129,"54335FB7660E"
+CPBR: 63,"0928836001",129,"92809234"
```

©2004 BenQ Corporation. Confidential Property

+CPBR: 69,"01285295711130",129,"0041004C004C0045004E"
+CPBR: 70,"0935657249",129,"0053002D0042004C00410043004B"
OK

3. Read the phonebook of item index1
AT+CPBR=5
+CPBR: 5,”27998800”,129,”Davis”
OK

Find phonebook entries +CPBF

Table: +CPBF parameter command syntax

Command	Possible response(s)
+CPBF=<findtext>	[+CPBF:<index1>,<number>,<type>,<text>] +CME ERROR: <err>
+CPBF=?	+CPBF: [<nlength>],[<tlength>] +CME ERROR:<err>

Description

1. Execution command returns the phonebook entries (from the current phonebook memory storage selected with +CPBS which alphanumeric fields starting with the giving string <findtext>. Entry fields returned are location number <indexn>, phone number stored there <number> (of format <type>) and text <text> associated with the number. If listing fails in an ME error, +CME ERROR: <err> is returned.
2. Test command returns the maximum lengths of <number> and <text> fields. In case of SIM storage, the lengths may not be available.
3. The AT+CPBF=”” command can be used to display all phonebook entries sorted in alphabetical order.
4. This command is only available for the “SM” and “ME” phonebook.
5. It is possible to use this command with UCS2 strings. If a wrong UCS2 format is entered, the string is considered as an ASCII string.

Defined values

<index1>: integer type value in the range of location numbers of phonebook memory.
<number>: string type indicating the phone number of format <type>
<type>: integer value indicating type of address octet in integer format.
<text>,<findtext>: string type ;character set specified by command select TE

©2004 BenQ Corporation. Confidential Property

character Set +CSCS(details pls refer to Appendix)
<nlength>: integer value indicating the maximum length of field <number>
<tlength>: integer value indicating the maximum length of field <text>

Informative examples

-Initial the HyperTerminal
-Initial the MS
-AT Command
AT+CPBS="SM"
OK
;;; List all phonebook entries start with "DA"
AT+CPBF="DA"
+CPBF: 1,"27998800",129,"DAVID"
+CPBF: 5,"123456",129,"dad"
+CPBF: 8,"222222",129,"Davis"
+CPBF: 10,"99999",129,"dAllen"
OK

Write phonebook entry +CPBW

Table: +CPBW parameter command syntax

Command	Possible response(s)
+CPBW=[<index>][,<number>[,<type>[,<text>]]]	+CME ERROR:<err>
+CPBW=?	+CPBW: (list of supported <index>s),[<nlength>],(list of supported <type>s),[<tlength>] +CME ERROR: <err>

Description

1. Set command writes phonebook entry in location number <index>of phonebook memory <storage> excluding "DC", "LD", "MC" and "RC". Entry fields written are phone number <number>(in the format <type>) and text <text> associated with the number. If <index> is left out, but <number> is given, entry is written to the first free location in the phonebook (the implementation of this feature is manufacturer specific.) If the fields except for <index> are omitted, phonebook storage entry will be deleted. If writing fails in an ME error, +CME ERROR:<err> is returned.

©2004 BenQ Corporation. Confidential Property

Defined values

<index>:integer type values in the range of location numbers of phonebook memory

<number>:string type; phone number

<type>: type of address octet in integer format

<text>,<findtext>: string type ;character set specified by command select TE character Set +CSCS(details pls refer to Appendix)

<nlength>: integer value indicating the maximum length of field <number>

<tlength>: integer value indicating the maximum length of field <text>

Informative examples

-Initial the HyperTerminal

-Initial the MS

-AT Command

1. AND, given <index>

(*PC will check if FDN is disabled in advance)

AT+CSCS?

+CSCS: "IRA"

AT+CPBW=1,"27998800", 129,"DAVID"

OK

2. AND but <index> is left out

(*PC will check if FDN is disabled in advance)

AT+CPBW=,"27998800", 129,"DAVID"

OK

3. Deleting entry

AT+CPBW=1

OK

Report Mobile Equipment error +CMEE

Table: +CMEE parameter command syntax

Command	Possible response(s)
+CPEE=[<n>]	
+CMEE?	+CMEE: <n>
+CMEE=?	+CMEE: (list of supported <n>s)

©2004 BenQ Corporation. Confidential Property

Description

Set command disables or enables the use of result code +CME ERROR: <err> as an indication of an error relating to the functionality of the ME. When enable, ME related errors cause +CME ERROR: <err> final result code instead of the regular ERROR final result code. ERROR is returned normally when error is related to syntax, invalid parameters, or TA functionality.

Defined values

<n>

0 Disable +CME ERROR: <err> result code and use ERROR instead

1 Enable +CME ERROR: <err> result code and use numeric <err> values.

2 Enable +CME ERROR: <err> result code and use verbose <err> values.

Informative examples

-Initial the HyperTerminal

-Initial the MS

-AT Command

AT+CMEE=?

+CMEE: (0-2)

OK

AT+CMEE?

+CMEE: 0

OK

AT+CMEE=1

OK

AT+CMEE?

+CMEE: 1

O K

2.1.6 Commands from TIA IS-101

Select mode +FCLASS

Table: +FCLASS parameter command syntax

Command	Return

+FCLASS=<n>	
+FCLASS?	<n>
+FCLASS=?	(list of supported <n>s)

Description

This command puts the TA into a particular mode of operation (data, fax, voice etc.). This causes the TA to process information in a manner suitable for that type of information (rather than for other types of information).

Defined values

The values and meanings of parameter <n> are specified in the following table.

<n> Mode

0	data
1	fax class 1 (TIA-578-A)
1.0	fax class 1 (ITU-T T.31 [11])
2	fax (manufacturer specific)
2.0	fax class 2 (ITU-T T.32 [12] and TIA-592)
3...7	reserved for other fax modes
8	voice
9...15	reserved for other voice modes
16..79	reserved
80	VoiceView (Radish)
81..255	reserved

Voice mode is of particular interest here, and has an additional result code +VCON. Specifically, +VCON indicates that the TA is entering the voice command mode and there is a voice connection to at least one audio input or output. This presupposes that some mechanism has previously initiated a connection to that audio I/O.

Informative examples

-Initial the HyperTerminal

-Initial the MS

-AT Command

AT+FCLASS=?

0,2.0,8

OK

AT+FCLASS?
0
OK

AT+FCLASS=2.0
OK

AT+FCLASS?
2.0
OK

DTMF and tone generation +VTS

Table: +VTS parameter command syntax

Command	Return
+VTS=<tone>	OK ERROR if there is no communication.
+VTS=?	(list of supported <tone1>s),(list of supported <tone2>s) ,(list of supported <duration>s)

NOTE: In GSM this operates only in voice mode.

Description

This command allows the transmission of DTMF tones and arbitrary tones (see note). These tones may be used (for example) when announcing the start of a recording period. The command is write only. In this profile of commands, this command does not operate in data or fax modes of operation (+FCLASS=0,1,2-7).

NOTE: D is used only for dialling.

The string parameter of the command consists of combinations of the following separated by commas:

1. <DTMF>. A single ASCII character in the set 0-9, #,*,A-D. This is interpreted as a single ACSII character whose duration is set by the +VTD command.

NOTE: In GSM this operates only in voice mode.

2. [<tone1>,<tone2>,<duration>]. This is interpreted as a dual tone of frequencies <tone1> and <tone2>, lasting for a time <duration> (in 10 ms multiples).

NOTE: This does not operate in GSM.

3. {<DTMF>,<duration>}. This is interpreted as a DTMF tone of different duration from that mandated by the +VTD command.

Informative examples

-Initial the HyperTerminal

-Initial the MS

-AT Command

AT+VTS=?

+VTS: (0,1,2,3,4,5,6,7,8,9,A,B,C,D,#,*)

OK

/* Setup voice call first…. */

AT+VTS=1

OK

AT+VTS=9

OK

Play DTMF tone +WDTMF

Table: +WDTMF parameter command syntax

Command	Possible response(s)
+WDTMF=<isEnable>[,<dtmf>,<gain>,<duration>]	

Description :

This specific command allows a DTMF tone to be played on the current speaker. DTMF, gain and duration can be set.

This command is only used to play a DTMF tone. To send a DTMF over the GSM network, use the +VTS command.

Defined values :

<isEnable>

0: Stop playing.

1: Play a DTMF tone

<dtmf>

This parameter sets the DTMF to play in {0-9,*,#,A,B,C,D} (mandatory if <mode>=1)

<gain> (0-15)

This parameter sets tone gain. By default, the value is 9.

<duration> (0-50)

This parameter sets the tone duration (unit of 100 ms).

When this parameter is 0 (default value), the duration is infinite, and the DTMF tone can be stopped by AT+WDTMF=0.

Receive gain selection +VGR

Table: +VGR parameter command syntax

Command	Return
+VGR=<n>	
+VGR?	<n>
+VGR=?	(list of supported <n>s)

Description

This command is used to tune the receive gain of speaker.

Defined values

n	Receive gain
1	-6db
2	-5db
3	-4db
4	-3db
5	-2db
6	-1db
7	0db
8	+1db
9	+2db
10	+3db
11	+4db
12	+5db
13	+6db

Transmit gain selection +VGT

Table: +VGTparameter command syntax

Command	Return
+VGT=<n>	
+VGT?	<n>
+VGT=?	(list of supported <n>s)

©2004 BenQ Corporation. Confidential Property

Description

This command is used to tune the transmit gain of microphone.

Defined values

n	Transmit gain
1	-12db
2	-11db
3	-10db
4	-9db
5	-8db
6	-7db
7	-6db
8	-5db
9	-4db
10	-3db
11	-2db
12	-1db
13	0db
14	+1db
15	+2db
16	+3db
17	+4db
18	+5db
19	+6db
20	+7db
21	+8db
22	+9db
23	+10db
24	+11db
25	+12db

©2004 BenQ Corporation. Confidential Property

2.2 Commands related to short message service

SMS Text Mode & PDU Mode

Parameter Definitions

The following parameters are used in the subsequent clauses which describe all commands.

Message Storage Parameters

<index> integer type (1-256); value in the range of location numbers supported by the associated memory

<mem1> string type; memory from which messages are read, and deleted; defined value:
‘‘BM’’ broadcast message storage
‘‘ME’’ ME message storage
‘‘MT’’ any of the storages associated with ME
‘‘SM’’ (U)SIM message storage
‘‘SR’’ status report storage

<mem2> string type; memory to which writing and sending operations are made; refer <mem1> for defined values

<mem3> string type; memory to which received SMs are preferred to be stored (unless forwarded directly to TE; refer command New Message Indications +CNMI); refer <mem1> for defined values

<stat> integer type in PDU mode (default 0), or string type in text mode (default "REC UNREAD"); indicates the status of message in memory; defined values:
0 "REC UNREAD" received unread message (i.e. new message)
1 "REC READ" received read message
2 "STO UNSENT" stored unsent message (only applicable to SMS)
3 "STO SENT" stored sent message (only applicable toSMS)
4 "ALL" all messages (only applicable to +CMGL command)

©2004 BenQ Corporation. Confidential Property

Message Data Parameters

<alpha> string type alphanumeric representation of <da> or <oa> corresponding to the entry found in MT phonebook; used character set should be the one selected with command Select TE Character Set +CSCS

<da> 3GPP TS 23.40 TP-Destination-Address Address-Value field in string format; BCD numbers (or GSM default alphabet characters) are converted to characters of the currently selected TE character set (refer command +CSCS in 3GPP TS 27.07); type of address given by <toda>

<data> In the case of SMS: 3GPP TS 23.040 TP-User-Data in text mode responses; format:

- if <dcs> indicates that 3GPP TS 23.038 default alphabet is used and <fo> indicates that 3GPP TS 23.040 TP-User-Data-Header-Indication is not set:
  - if TE character set other than "HEX" (refer +CSCS) : ME/TA converts GSM alphabet into current TE character set according to rules of Annex A
  - if TE character set is "HEX": ME/TA converts each 7-bit character of GSM alphabet into two IRA character long hexadecimal number (e.g. character Π (GSM 23) is presented as 17 (IRA 49 and 55))
- if <dcs> indicates that 8-bit or UCS2 data coding scheme is used, or <fo> indicates that GSM 03.40 TP-User-Data-Header-Indication is set: ME/TA converts each 8-bit octet into two IRA character long hexadecimal number (e.g. octet with integer value 42 is presented to TE as two characters 2A (IRA 50 and 65))

<dcs> depending on the command or result code: 3GPP TS 23.038 SMS Data Coding Scheme (default 0)

<dt> GSM 03.40 TP-Discharge-Time in time-string format: “yy/MM/dd,hh:mm:ss±zz”, where characters indicate year (two last digits), month, day, hour, minutes, seconds and time zone. E.g. 6th of May 1994, 22:10:00 GMT+2 hours equals to “94/05/06,22:10:00+08”

<fo> depending on the command or result code: first octet of 3GPP 23.040 SMS-DELIVER, SMS-SUBMIT (default 17), SMS-STATUS-REPORT, or SMS-COMMAND (default 2) in

©2004 BenQ Corporation. Confidential Property

integer format

<length> Integer type value indicating in the text mode (+CMGF=1) the length of the message body <data> in characters; or in PDU mode (+CMGF=0), the length of the actual TP data unit in octets (i.e. the RP layer SMSC address octets are not counted in the length)

<mr> 3GPP TS 23.040 TP-Message-Reference in integer format

<oa> 3GPP TS 23.040 TP-Originating-Address Address-Value field in string format; BCD numbers (or GSM default alphabet characters) are converted to characters of the currently selected TE character set (refer +CSCS); type of address given by <tooa>

<pdu> In the case of SMS: 3GPP TS24.011 SC address followed by 3GPP TS 23.040 TPDU in hexadecimal format: ME/TA converts each octet of TP data unit into two IRA character long hexadecimal number (e.g. octet with integer value 42 is presented to TE as two characters 2A (IRA 50 and 65))

<pid> 3GPP TS 23.040 TP-Protocol-Identifier in integer format (default 0)

0x00	plain text
0x21	telex
0x22	group 3 telefax
0x23	group 4 telefax
0x24	voice telephone
0x25	ERMES
0x26	National paging system
0x32	Internet Electronic Mail

<ra> 3GPP TS 23.040 TP-Recipient-Address Address-Value field in string format; BCD numbers (or GSM default alphabet characters) are converted to characters of the currently selected TE character set (refer +CSCS); type of address given by <tora>

<sca> 3GPP TS 24.011 RP SC address Address-Value field in string format; BCD numbers (or GSM default alphabet characters) are converted to characters of the currently selected TE character set (refer +CSCS); type of address given by <tosca>

<scts> 3GPP TS 23.040 TP-Service-Centre-Time-Stamp in time-string format (refer <dt>)

©2004 BenQ Corporation. Confidential Property

<sn>	3GPP TS 23.041CBM Serial Number in integer format
<st>	3GPP 23.040 TP-Status in integer format
<toda>	3GPP 24.011 TP-Destination-Address Type-of-Address octet in integer format (when first character of <da> is + (IRA 43) default is 145, otherwise default is 129)
<tooa>	3GPP 24.011 TP-Originating-Address Type-of-Address octet in integer format (default refer <toda>)
<tosca>	3GPP 24.011 RP SC address Type-of-Address octet in integer format (default refer <toda>)
<tora>	3GPP 24.011 TP-Originating-Address Type-of-Address octet in integer format (default refer <toda>)
<vp>	depending on SMS-SUBMIT <fo> setting: 3GPP 23.040 TP-Validity-Period either in integer format (default 167) or in time-string format (refer <dt>), or if $(EVPF)$ is supported, in enhanced format (hexadecimal coded string with double quotes)
(text&PDU)	Commands available on both text and PDU mode
(text)	Commands available on only text mode
(PDU)	Commands available on only PDU mode

2.2.1 General Configuration Commands

Select Message Service +CSMS

Table: +CSMS parameter command syntax (text & PDU)

Command	Possible response(s)
+CSMS=<service>	+CSMS: <mt>,<mo>,<bm> +CMS ERROR: <err>
+CSMS?	+CSMS: <service>,<mt>,<mo>,<bm>
+CSMS=?	+CSMS: (list of supported <service>s)

Description

Set command selects messaging service <service>. It returns the types of messages supported by the ME: <mt> for mobile terminated messages, <mo> for mobile originated messages and <bm> for broadcast type messages. If chosen service is not supported by the ME (but is supported by the TA), final result code +CMS ERROR: <err> shall be returned. See chapter Message Service Failure Result Code for a list of <err> values.

Also read command returns supported message types along the current service setting. Test command returns a list of all services supported by the TA.

Defined values

<service>:

0	GSM 03.40 and 03.41
1	GSM 03.40 and 03.41(the requirement of <service> setting 1 is mentioned under corresponding command descriptions.)

<mt>, <mo>, <bm>:

0	type not supported
1	type supported

Informative examples

-Initial the HyperTerminal

-Initial the MS

-AT Command

1. Set Message Service

AT+CSMS=0

+CSMS:1,1,1

OK

©2004 BenQ Corporation. Confidential Property

2. Show Message Service

AT+CSMS?

+CSMS:0,1,1,1

OK

Preferred Message Storage +CPMS

Table: +CPMS parameter command syntax

Command	Possible response(s)
+CPMS=<mem1>[,<mem2>][,<mem3>]	+CPMS: <used1>, <total1>, <used2>, <total2>, <used3>, <total3> +CMS ERROR: <err>
+CPMS?	+CPMS: <used1>, <total1>, <used2>, <total2>, <used3>, <total3> +CMS ERROR: <err>
+CPMS=?	+CPMS: (list of supported <mem1>s), (list of supported <mem2>s), (list of supported <mem3>s)

Description

Set command selects memory storages <mem1>, <mem2> and <mem3> to be used for reading, writing, etc. If chosen storage is not appropriate for the ME (but is supported by the TA), final result code +CMS ERROR: <err> shall be returned. See chapter Message Service Failure Result Code for a list of possible <err> values.

Test command returns lists of memory storages supported by the TA.

<**mem1**>: Memory used to list, read and delete messages. It can be:

"SM": SMS message storage in SIM (default)

"ME" : ME message storage

<**mem2**>: Memory used to write and send messages

"SM": SMS message storage in SIM (default).

Informative examples

-Initial the HyperTerminal

-Initial the MS

-AT Command

1.Set All ME & Show Message list

©2004 BenQ Corporation. Confidential Property

AT+CPMS= "ME","ME","ME"
+CPMS: 0,0,0,0,0,0
OK

AT+CPMS?
+CPMS: "ME",0,0,"ME",0,0,"ME",0,0
OK

2.Set ME & check message number and total space

AT+CPMS = "ME"
+CPMS: 0,0,3,15,3,15
OK

AT+CPMS?
+CPMS: "ME",0,0,"SM",3,15,"SM",3,15
OK

3.Set All SM

AT+CPMS= "SM","SM","SM"
+CPMS: 3,15,3,15,3,15
OK

AT+CPMS?
+CPMS: "SM",3,15,"SM",3,15,"SM",3,15
OK

Message Format +CMGF

Table: +CMGF parameter command syntax (text & PDU)

Command	Possible response(s)
+CMGF=[<mode>]	+CMS ERROR: <err>
+CMGF?	+CMGF: <mode>
+CMGF=?	+CMGF: (list of supported <mode>s)

Description

Set command tells the TA, which input and output format of messages to use. <mode> indicates the format of messages used with send, list, read and write commands and unsolicited result codes resulting from received messages. Mode can be either PDU mode (entire TP data units used) or text mode (headers and

body of the messages given as separate parameters). Text mode uses the value of parameter <chset> specified by command Select TE Character Set +CSCS to inform the character set to be used in the message body in the TA-TE interface.

Test command returns supported modes as a compound value.

Defined values

<mode>:

0	PDU mode (default)
1	text mode

Informative examples

-Initial the HyperTerminal

-Initial the MS

-AT Command

1. Set Text Mode

   AT+CMGF=1

   OK

   AT+CMGF?

   +CMGF: 1

   OK

2. Set PDU mode (default)

   AT+CMGF?

   +CMGF: 0

   OK

2.2.2 Message Configuration Commands

Service Centre Address +CSCA

Table: +CSCA parameter command syntax (text & PDU)

Command	Possible response(s)
+CSCA = <sca>[,<tosca>]	
+CSCA?	+CSCA: <sca>,<tosca>

Description

Set command updates the SMSC address, through which mobile originated SMs are transmitted. In text mode, setting is used by send and write commands. In

©2004 BenQ Corporation. Confidential Property

PDU mode, setting is used by the same commands, but only when the length of the SMSC address coded into <pdu> parameter equals zero.

Informative examples

-Initial the HyperTerminal

-Initial the MS

-AT Command

1. Set SC address

AT+CSCA=”+886935074443”,145

OK

2. Read SC address

AT+CSCA?

+CSCA: “+886935074443”,145

OK

Set Text Mode Parameters +CSMP

Table: +CSMP parameter command syntax (text)

Command	Possible response(s)
+CSMP=[<fo>[,<vp>[,<pid>[,<dcs>]]]]	
+CSMP?	+CSMP: <fo>,<vp>,<pid>, <dcs>

Description

Set command is used to select values for additional parameters needed when SM is sent to the network or placed in a storage when text format message mode is selected. It is possible to set the validity period starting from when the SM is received by the SMSC (<vp> is in range 0... 255) or define the absolute time of the validity period termination (<vp> is a string). The format of <vp> is given by <fo>.

NOTE: When storing a SMS-DELIVER from the TE to the preferred memory storage in text mode (refer command Write Message to Memory +CMGW), <vp> field can be used for <scts>.

Defined values

<fo>: integer type

Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0

Bit 4, Bit 3 TP-VPF

0 0 TP-VP field not present

1 0 TP-VP field present – relative format
0 1 TP-VP field present – enhanced format (not supported)
1 1 TP-VP field present – absolute format

Bit 2 TP-RD (Reserved)

Bit 1, Bit 0 TP-MTI
0 1 SMS-SUBMIT (in the direction MS to SC)

<vp>: integer type

0 to 143	(vp + 1) * 5 minutes
144 to 167	12 hours + ((vp – 143) * 30 minutes)
168 to 196	(vp – 166) * 1 day
197 to 255	(vp – 192) * 1 week

<pid>: integer type

Please see 03.40 TP-Protocol-Identifier (TP-PID) description. Default 0.

<dcs>: integer type

0x00	Default alphabet (default)
0x04	8 bit data
0x08	UCS2 (16bit)

Informative examples

-Initial the HyperTerminal
-Initial the MS
-AT Command

1. Set parameter for saving/sending short message (<vp> field is relative format, <vp> = 2 days, <pid> = 0, <dcs>=0)

AT+CSMP=17,168,0,0
OK

2. Set parameter for 8bit message and keeps other parameter unchanged

AT+CSMP=,,,4
OK

Show Text Mode Parameters +CSDH

Table: +CSDH parameter command syntax (text)

Command	Possible response(s)
+CSDH =[<show>]	
+CSDH?	+CSDH: <show>

©2004 BenQ Corporation. Confidential Property

+CSDH=?	+CSDH: (list of supported <show>s)

Description

Set command controls whether detailed header information is shown in text mode result codes.

Defined values

<show>:

0 do not show header values defined in commands +CSCA and +CSMP (<sca>, <tosca>, <fo>, <vp>, <pid> and <dcs>) nor <length>, <toda> or <tooa> in +CMT, +CMGL, +CMGR result codes for SMS-DELIVERs and SMS-SUBMITs in text mode; for SMS-COMMANDs in +CMGR result code, do not show <pid>, <mn>, <da>, <toda>, <length> or <cdata>

1 show the values in result codes

Informative examples

-Initial the HyperTerminal

-Initial the MS

-AT Command

1. Set command

AT+CSDH=1

OK

2. Read command

AT+CSDH?

+CSDH: 1

OK

3. Test command

AT+CSDH=?

+CSDH: (0,1)

OK

Select Cell Broadcast Message Types +CSCB

Table: +CSCB parameter command syntax (text & PDU)

Command	Possible response(s)

+CSCB = [<mode>[,<mids>[,<dcss>]]]	
+CSCB?	+CSCB: <mode>,<mids>,<dcss>
+CSCB=?	+CSCB: (list of supported <mode>s)

Description

Set command selects which types of CBMs are to be received by the ME.
Test command returns supported modes as a compound value.
If <mids> or <dcss> set empty string, there is no action on <mids> or <dcss>.

Defined values

<mode>:

0 message types specified in <mids> and <dcss> are accepted

1 message types specified in <mids> and <dcss> are not accepted

<mids>: string type; all different possible combinations of CBM message identifiers (refer <mid>) (default is empty string); e.g. "0,1,5,320-478,922"
<dcss>: string type; all different possible combination of CBM data coding schemes (refer <dcs>) (default is empty string); e.g. "0-3,5"

Note: Supported values for parameter <mids> and <dcss>: maximum of 20 ranges could be declared for each parameter.

Informative examples

-Initial the HyperTerminal
-Initial the MS
-AT Command

1.read message types

AT+CSCB?
+CBCB: 0,"1,4,10","2,3"
OK

2.set message types

Note: the number of <mids> and <dcss> depends on services scope of the service provider.

(1) set <mids>,<dcss> in the command to be accepted . And the number of <mids>, <dcss> are in the supported range.

AT+CSCB=0,"1,4,5","3,4"

OK

AT+CSCB?

+CSCB=0, “1,4,5”,”3,4”

OK

(2)<mids> or <dcss> setting are out of the supported range

AT+CSCB=0,”65536”,”7,8”

+CMS ERROR: 302

AT+CSCB?

+CSCB=0,”1,4,5”,”3,4”

OK

Note: The values are set step by step, so, the values behind the supported range are discarded with a +CMS error.

(3) set <mids> or <dcss> in the command to be unaccepted.

AT+CSCB=1,”2-5”,”8”

OK

AT+CSCB?

+CSCB=0,”2-5”,”8”

OK

Save Settings +CSAS

Table: +CSAS parameter command syntax (text & PDU)

Command	Possible response(s)
+CSAS = [<profile>]	+CMS ERROR: <err>
+CSAS=?	+CSAS: (list of supported <profile>s)

Description

Execution command saves active message service settings to a non-volatile memory. A TA can contain several profiles of settings. Settings specified in commands Service Centre Address +CSCA, Set Message Parameters +CSMP and Select Cell Broadcast Message Types +CSCB (if implemented) are saved. Certain settings may not be supported by the storage (e.g. (U)SIM SMS parameters) and therefore can not be saved.

Defined values

<profile> ; 0-1 profile number where settings are to be stored.

Informative examples

-Initial the HyperTerminal

-Initial the MS

-AT Command

1.Query +CSAS Support

AT+CSAS=?

+CSAS: (0-1)

OK

2.Set +CSAS=1

AT+CSAS=1

OK

Restore Settings +CRES

Table: +CRES parameter command syntax

Command	Possible response(s)
+CRES = [<profile>]	+CMS ERROR: <err>
+CRES=?	+CRES: (list of supported <profile>s)

Description

Execution command restores message service settings from non-volatile memory to active memory. A TA can contain several profiles of settings. Settings specified in commands Service Centre Address +CSCA, Set Message Parameters +CSMP and Select Cell Broadcast Message Types +CSCB (if implemented) are restored. Certain settings may not be supported by the storage (e.g. (U)SIM SMS parameters) and therefore can not be restored

.

Defined values

<profile> : 0-1 profile number where settings are to be restored.

Information examples

-Initial the HyperTerminal

-Initial the MS

-AT Command

1.Query +CRES Support

AT+CRES=?

+CRES: (0,2)
OK

2.Set +CRES=1
AT+CRES=1
OK

2.2.3 Message Receiving and Reading Commands

New Message Indications to TE +CNMI

Table: +CNMI parameter command syntax (text & PDU)

Command	Possible response(s)
+CNMI=[<mode>[,<mt>[,<bm>[,<ds>[,<bfr>]]]]]	+CMS ERROR: <err>
+CNMI?	+CNMI: <mode>,<mt>,<bm>,<ds>, <bfr>
+CNMI=?	+CNMI: (list of supported <mode>s), (list of supported <mt>s), (list of supported <bm>s), (list of supported <ds>s), (list of supported <bfr>s)

Description

Set command selects the procedure, how receiving of new messages from the network is indicated to the TE when TE is active, e.g. DTR signal is ON.

<mode> controls the processing of unsolicited result codes specified within this command, <mt> sets the result code indication routing for SMS-DELIVERs, <bm> for CBMs and <ds> for SMS-STATUS-REPORTs. <bfr> defines the handling method for buffered result codes when <mode> 1, 2 or 3 is enabled. If ME does not support requested item (although TA does), final result code +CMS ERROR: <err> is returned.

Test command gives the settings supported by the TA as compound values.

NOTE: Command Select Message Service +CSMS should be used to detect ME support of mobile terminated SMs and CBMs, and to define whether a message routed directly to TE should be acknowledged or not.

Defined values

<mode>

0 Buffer unsolicited result codes in the TA. If TA result

©2004 BenQ Corporation. Confidential Property

code buffer is full, indications can be buffered in some other place or the oldest indications may be discarded and replaced with the new receiver indications.

1 Discard indication and reject new received message unsolicited result code when TA-TE link is reserved (e.g. in on-line data mode). Otherwise forward them directly to the TE.

2 Buffer unsolicited result codes in the TA when TA-TE link is reserved (e.g. in on-line data mode) and flush them to the TE after reservation. Otherwise forward them directly to the TE.

<mt>

0 No SMS-DELIVER (message to ME) indications are routed to the TE. Default.

1 SMS-DELIVER is stored in ME. Indication of the memory location is routed to the TE by using the unsolicited result code:
+CMTI: <mem>, <index>

2 class 0, class 1 and class 3 SMS-DELIVERs are routed directly to the TE using unsolicited result code:

+CMT: [<alpha>],<length><CR><LF><pdu> (PDU mode enabled)

or

+CMT: <oa>, <alpha>],<scts>,<tooa>,<fo>,<pid>,<dcs>, <sca>,<tosca>,<length>]<CR><LF><data> (text mode enabled; about parameters in italics, refer command +CSDH)

class 0 message and messages in the message waiting indication group (discard message), may be copied to TE, In this case , ME shall send the acknowledgement to the network.
Class2 message and messages in the message waiting indication group (store message) result in indication as defined in <mt>=1

<bm>

0 No CBM indications are routed to the TE. Default

2 CBM is routed directly to the TE by using the unsolicited

©2004 BenQ Corporation. Confidential Property

result code:

+CBM: <length><CR><LF><pdu> (PDU mode enabled)

or

+CBM: <sn>,<mid>,<dcs>,<page>,<pages><CR><LF><data> (text mode enabled)

refer to 03.41, Content of message is limited to 82 bytes and total pages are no more than 15.

<ds>

0 No SMS-STATUS-REPORTs are routed to the TE

1 SMS-STATUS-REPORTs are routed to the TE using unsolicited result code:
+CDS: <length><CR><LF><pdu> (PDU mode enabled)
or
+CDS: <fo>,<mr>,[<ra>],[<tora>],<scts>,<dt>,<st> (text mode enabled)

<bfr>

0 TA buffer of unsolicited result codes defined within this command is flushed to the TE when <mode> 1…3 is entered (OK response shall be given before flushing the codes)

1 TA buffer of unsolicited result codes defined within this command is cleared when <mode> 1..3 is entered.

Informative examples

-Initial the HyperTerminal
-Initial the MS
-AT Command
AT+CNMI=?
+CNMI: (0-2),(0-3),(0,2),(0,1),(0,1)
OK

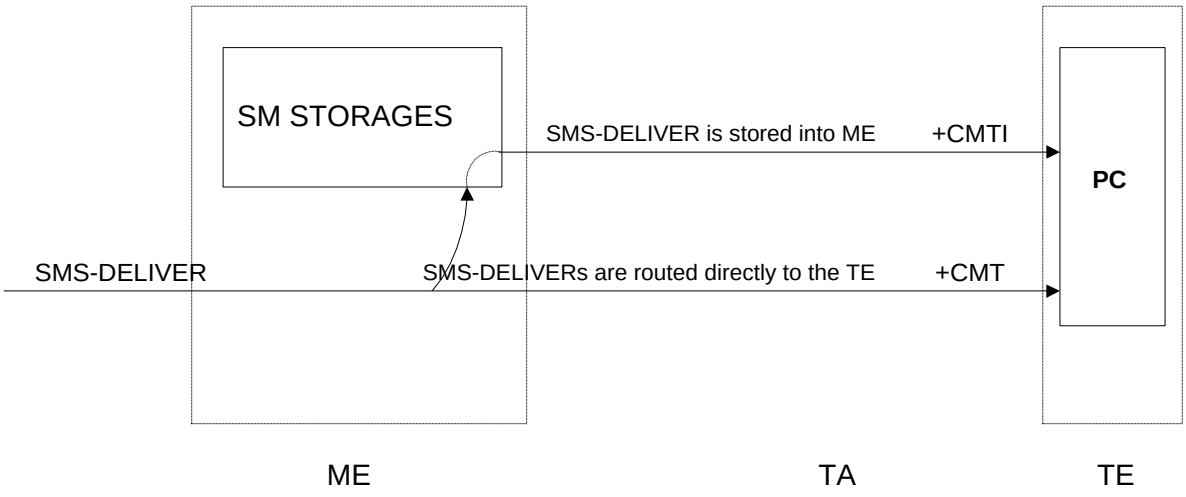
AT+CNMI?
+CNMI: 0,0,0,0,0
OK

AT+CNMI =0,0,0,0,0

©2004 BenQ Corporation. Confidential Property

OK
AT+CNMI?
+CNMI: 0,0,0,0,0
OK

AT+CNMI =1,3,2,1,1
OK
AT+CNMI?
+CNMI: 1,3,2,1,1
OK



Message receiving procedures

List Messages +CMGL

Table: +CMGL Action Command Syntax (text)

Command	Possible response(s)
+CMGL[=<stat>]	**if text mode (+CMGF=1), command successful and SMS-SUBMITs and/or SMS-DELIVERs:** +CMGL: <index>,<stat>,<oa/da>,[<alpha>],[<scts>][,<tooa/toda>,<length>]<CR><LF><data>[<CR><LF> +CMGL: <index>,<stat>,<da/oa>,[<alpha>],[<scts>][,<tooa/toda>,<length>]<CR><LF><da

	ta>[...]] **otherwise:** +CMS ERROR: <err>

Description

Execution command returns messages with status value <stat> from message storage <mem1> to the TE. About text mode parameters in italics, refer command Show Text Mode Parameters +CSDH. If status of the message is 'received unread', status in the storage changes to 'received read'. If listing fails, final result code +CMS ERROR: <err> is returned.

NOTE: If the selected <mem1> can contain different types of SMs (e.g. SMS-DELIVERs, SMS-SUBMITs), the response may be a mix of the responses of different SM types. TE application can recognize the response format by examining the third response parameter.

Informative examples

-Initial the HyperTerminal

-Initial the MS

-AT Command

1.List All Messages

AT+CMGF=1

OK

AT+CMGL="ALL"

+CMGL: 2,"STO UNSENT","0921214863",,,129,4

TEST

OK

AT+CMGL=”STO UNSENT”

+CMGL: 2,"STO UNSENT","0921214863",,,129,4

TEST

OK

2.List Message

AT+CMGF=0

OK

AT+CMGL=2

+CMGL: 2,2,,17

06819073048014110 00A8190121284360000A804D4E2940A

OK

Read Message +CMGR

Table: +CMGR Action Command Syntax (text)

Command	Possible response(s)
+CMGR=<index>[,<State>]	**if text mode (+CMGF=1), command successful and SMS-DELIVER:** +CMGR: <stat>,<oa>,[<alpha>],<scts>[,<tooa>, <fo>,<pid>,<dcs>,<sca>,<tosca>,<length>]<CR><LF><data> **if text mode (+CMGF=1), command successful and SMS-SUBMIT:** +CMGR: <stat>,<da>,[<alpha>][,<toda>,<fo>, <pid>,<dcs>,[<vp>],<sca>,<tosca>,<length>]<CR><LF><data> **If reading fails:** +CMS ERROR: <err>

Description

Execution command returns message with location value <index> from message storage <mem1> to the TE. About text mode parameters in italics, refer command Show Text Mode Parameters +CSDH. If status of the message is 'received unread', status in the storage changes to 'received read'. If reading fails, final result code +CMS ERROR:<err> is returned.

State

If <State> equal to 1, MS will not change the reading state of the message. If <State> equal to 0, MS will change the reading state of the message.

Informative examples

-Initial the HyperTerminal

-Initial the MS

-AT Command

1. read the message

AT+CMGR=0;+CMGR=1;+CMGR=2;+CMGR=4

+CMGR: 2,,26

©2004 BenQ Corporation. Confidential Property

07918896834348221 1B602812500008F13683A1DAE7BBDEEF7BB4B5C76C75D
E3771B

+CMGR: 2,,26
07918896834348221 1B602812500008F13683A1DAE7BBDEEF7BB4B5C76C75D
E3771B

+CMGR: 2,,36
07918896834348225 1B702812200008F1E040D021800A0E974B8EEF5BADFEF2
E71D91D778DDF6D90
3A4C0601

+CMGR: 2,,35
07918896834348225 1BA02812500008F1D0A0A030606010A030C04020893D567
BA421D26ABE98A7B
5B1D06
OK

2. reading fail
AT+CMGR=3
ERROR

NEW Message Acknowledgement to ME/TA +CNMA

Table: +CNMA Action Command Syntax

Command	Possible response(s)
If text mode (+CMGF=1): +CNMA	+ CMS ERROR: <err>
+CNMA=?	

Description

Execution command confirms correct reception of a new message (SMS=DELIVER or SMS-STATUS-REPORT) which is routed directly to the TE (refer command +CNMI tables 2 and 4). This acknowledgement command (causing ME to send RP-ACK to the network) shall be used when +CSMS parameter <service> equals 1. TA shall not send another +CMT or +CDS result code to TE before previous one is acknowledged.

If ME does not get acknowledgement within required time (network timeout), ME should send RP-ERROR to the network. ME/TA shall automatically disable routing to TE setting both <mt> and <ds> values of +CNMI to zero.
If command is executed, but no acknowledge is excepted, or some other ME related error occurs, final result code +CMS ERROR: <err> is returned. See chapter Message Service Failure Result Code for a list of <err> values.
NOTE: In case that a directly routed message must be buffered in ME/TA (possible when +CNMI parameter <mode> equals 0 or 2) or AT interpreter remains too long in a state where result codes cannot be sent to TE (e.g. user is entering a message using +CMGS), acknowledgement (RP-ACK) must be sent to the network without +CNMA command from TE. Later, when buffered result codes are flushed to TE, TE must send +CNMA acknowledgement for each result code. In this way, ME/TA can determine if message should be placed in non-volatile memory and routing to TE disabled(+CNMA not received). Refer command +CNMI for more details how to use <mode> parameter reliably.

Informative examples
None Support

2.2.4 Message Sending and Writing Commands

Send Message +CMGS

Table: +CMGS Action Command Syntax (text)

Command	Possible response(s)
if text mode (+CMGF=1): +CMGS=<da>[,<toda>]<CR> *text is entered* <ctrl-Z/ESC>	**if text mode (+CMGF=1) and sending successful:** +CMGS: <mr>[,<scts>] **if sending fails:** +CMS ERROR: <err>

Description

Execution command sends message from a TE to the network (SMS-SUBMIT). Message reference value <mr> is returned to the TE on successful message delivery. Optionally (when +CSMS <service> value is 1 and network supports) <scts> is returned. Values can be used to identify message upon unsolicited delivery status report result code. If sending fails in a network or an ME error, final result code +CMS ERROR: <err> is returned. This command should be abortable.

Description

Execution command sends message from a TE to the network (SMS-SUBMIT). Message reference value <mr> is returned to the TE on successful message delivery. Value can be used to identify message upon unsolicited delivery status report result code.

- entered text (3GPP TS 23.040 TP-Data-Unit) is sent to address <da> and all current settings (refer Set Text Mode Parameters +CSMP and Service Centre Address +CSCA) are used to construct the actual PDU in ME/TA
- the DCD signal shall be in ON state while text is entered
- the echoing of entered characters back from the TA is controlled by V.25ter echo command E
- the entered text should be formatted as follows:
  - if <dcs> (set with +CSMP) indicates that 3GPP TS 23.038 default alphabet is used and <fo> indicates that 3GPP TS 23.040 TP-User-Data-Header-Indication is not set:
    - if TE character set other than "HEX" (refer command Select TE Character Set +CSCS in 3GPP TS 27.007):ME/TA converts the entered text into GSM alphabet according to rules of Annex A; backspace can be used to delete last character and carriage returns can be used
    - if TE character set is "HEX": the entered text should consist of two IRA character long hexadecimal numbers which ME/TA converts to 7-bit characters of GSM alphabet (e.g. 17 (IRA 49 and 55) will be converted to character ψ (GSM 23))
  - if <dcs> indicates that 8-bit or UCS2 data coding scheme is used or <fo> indicates that 3GPP TS 23.040 TP-User-Data-Header-Indication is set: the entered text should consist of two IRA character long hexadecimal numbers which ME/TA converts into 8-bit octet (e.g. two characters 2A (IRA 50 and 65) will be converted to an octet with integer value 42)
- sending can be cancelled by giving <ESC> character (IRA 27)
- <ctrl-Z> (IRA 26) must be used to indicate the ending of the message body

Informative examples

-Initial the HyperTerminal

-Initial the MS

-AT Command

AT+CMGF=1

OK

©2004 BenQ Corporation. Confidential Property

AT+CMGS=?
OK
OK
AT+CMGS="0921214863"
> TEST
+CMGS: 230
OK
OK

Send Message from Storage +CMSS

Table: +CMSS Action Command Syntax (text)

Command	Possible response(s)
if text mode (+CMGF=1): +CMSS=<index>[,<da>[,<toda>]]	**If text mode (+CMGF=1) and sending successful:** +CMSS: <mr> **if sending fails:** +CMS ERROR: <err>

Description

Execution command sends message with location value <index> from preferred message storage <mem2> to the network (SMS-SUBMIT). If new recipient address <da> is given for SMS-SUBMIT, it shall be used instead of the one stored with the message. Reference value <mr> is returned to the TE on successful message delivery. If sending fails in a network or an ME error, final result code +CMS ERROR: <err> is returned. This command should be abortable.

Defined values

<index>: integer type
<da>: string type
<toda>: integer type

Informative examples

-Initial the HyperTerminal
-Initial the MS
-AT Command
AT+CMGF=1
OK

©2004 BenQ Corporation. Confidential Property

AT+CMGW="0921214863"
> TEST1
+CMGW: 11
OK
AT+CMSS=11
+CMSS: 234
OK

Write Message to Memory +CMGW

Table: +CMGW Action Command Syntax (text)

Command	Possible response(s)
if text mode (+CMGF=1): +CMGW[=<da>[,<toda>[, <stat>]]]<CR> *text is entered* <ctrl-Z/ESC>	**If saving successful:** +CMGW: <index> **If saving fails:** +CMS ERROR: <err>

Description

Execution command stores message (SMS-SUBMIT) to memory storage <mem2>. Memory location <index> of the stored message is returned. By default message status will be set to "stored unsent". The entering of text is done similarly as specified in command Send Message +CMGS.

Defined values

<stat>

2 Stored unsent

Informative examples

-Initial the HyperTerminal

-Initial the MS

-AT Command

1. Writing SM in GSM

We try to send ‘‘TEST’’ to number ‘‘0921214863’’

AT+CMGF=1

OK

AT+CSCS=’’GSM’’

OK

AT+CSMP=17,168,0,0
OK
AT+CMGW=”0921214863”,129,”STO UNSENT”<CR>
>TEST<ctrl-z>
+CMGW:12
OK

Delete Message +CMGD

Table: +CMGD Action Command Syntax (text & PDU)

Command	Possible response(s)
+CMGD=<index>	+CMS ERROR: <err>

Description

Execution command deletes message from preferred message storage <mem1> location <index>.

Informative Examples

-Initial the HyperTerminal
-Initial the MS
-AT Command
Delete Message number 7
AT+CMGD=7 (delete message)
OK

Send Command +CMGC

Table: +CMGC Action Command Syntax (text & PDU)

Command	Possible response(s)
If text mode (+CMGF=1) +CMGC=<fo>, <ct>[,<pid>[,<mn>[,<da>[, <toda>]]]]<CR> textis entered< ctrl-z/ESC>	If text mode (+CMGF=1) and sending successful: +CMGC: <mr>[,<scts>] if sending fails: +CMS ERROR: <err>

Description

Execution command sends a command message from a TE to the network

©2004 BenQ Corporation. Confidential Property

(SMS-COMMAND). The entering of text is done similarly as specified in command Send Message +CMGS, but the format is fixed to be a sequence of two IRA character long hexadecimal numbers which ME/TA converts into 8-bit octets.

Informative Examples

-Initial the HyperTerminal

-Initial the MS

-AT Command

AT+CMGF=1

AT+CMGS="0921214863",129

>This a test!

(ctrl+z)

+CMGS:14

AT+CNMI=1,0,0,1,0

OK

AT+CMGC=,,,14,"0921214863",129

>

(ctrl+z)

+CMGC: 15

+CDS:SMS-STATUS-REPORT

2.2.5 PDU Mode

List Message +CMGL

Table: +CMGL Action Command Syntax (PDU)

Command	Possible response(s)
+CMGL[=<stat>]	if PDU mode (+CMGF=0) and command successful: +CMGL: <index>,<stat>,[<alpha>], <length><CR><LF><pdu>[<CR><LF>+CMGL: <index>,<stat>,[<alpha>], <length><CR><LF><pdu>[...]] otherwise: +CMS ERROR: <err>
+CMGL=?	+CMGL: (list of supported <stat>s)

Description

Execution command returns messages with status value <stat> from

preferred message storage <mem1> to the TE. Entire data units <pdu> are returned. If status of the message is 'received unread', status in the storage changes to 'received read'. If listing fails, final result code +CMS ERROR: <err> is returned.

Test command shall give a list of all status values supported by the TA.

Informative Examples

-Initial the HyperTerminal

-Initial the MS

-AT Command

1.

AT+CMGL=?

+CMGL: (0,1,2,3,4)

OK

2.

AT+CMGF=0

AT+CMGL=2

+CMGL: 1,2,,8

07918896834348221100008000004A800

+CMGL: 2,2,,36

07918896834348225 1B702812200008F1E040D021800A0E974B8EEF5BADFEF2

E71D91D778DDF6D90

3A4C0601

+CMGL: 3,2,,8

07918896834348221100008000004A800

+CMGL: 4,2,,35

07918896834348225 1BA02812500008F1D0A0A030606010A030C04020893D567

BA421D26ABE98A7B

5B1D06

+CMGL: 5,2,,9

07918896834348221100008000004A801E1

+CMGL: 6,2,,9

07918896834348221100008000004A801E4

OK

Read Message +CMGR

Table: +CMGR Action Command Syntax (PDU)

Command	Possible response(s)
+CMGR=<index>	if PDU mode (+CMGF=0) and command successful: +CMGR:<stat>,[<alpha>],<length><CR> <LF> <pdu> otherwise: +CMS ERROR: <err>

Description

Execution command returns message with location value <index> from preferred message storage <mem1> to the TE. Status of the message and entire message data unit <pdu> is returned. If status of the message is 'received unread', status in the storage changes to 'received read'. If reading fails, final result code +CMS ERROR: <err> is returned.

Informative Examples

-Initial the HyperTerminal

-Initial the MS

-AT Command

1.

AT+CMGR=?

OK

AT+CMGR?

OK

2.

AT+CMGF=0

OK

AT+CMGR=2

+CMGR: 2,,36

07918896834348225 1B702812200008F1E040D021800A0E974B8EEF5BADFEF2E71D91D778DDF6D90

3A4C0601

OK

AT+CMGR=4

+CMGR: 2,,35

07918896834348225 1BA02812500008F1D0A0A030606010A030C04020893D567
BA421D26ABE98A7B
5B1D06
OK
AT+CMGR=3
+CMGR: 2,,8
07918896834348221100008000004A800
OK
AT+CMGR=5
+CMGR: 2,,9
07918896834348221100008000004A801E1
OK

Send Message +CMGS

Table: +CMGS Action Command Syntax (PDU)

Command	Possible response(s)
if PDU mode (+CMGF=0): +CMGS=<length><CR> *PDU is given*<ctrl-Z/ESC>	**if PDU mode (+CMGF=0) and sending successful:** +CMGS: <mr>[,<ackpdu>] **if sending fails:** +CMS ERROR: <err>

Description

Execution command sends message from a TE to the network (SMS-SUBMIT). Message reference value <mr> is returned to the TE on successful message delivery. Optionally (when +CSMS <service> value is 1 and network supports) <ackpdu> is returned. Values can be used to identify message upon unsolicited delivery status report result code. If sending fails in a network or an ME error, final result code +CMS ERROR: <err> is returned. This command should be abortable.

- <length> must indicate the number of octets coded in the TP layer data unit to be given (i.e. SMSC address octets are excluded)
- the PDU shall be hexadecimal format (similarly as specified for <pdu>) and given in one line; ME/TA converts this coding into the actual octets of PDU
- when the length octet of the SMSC address (given in the PDU) equals zero, the SMSC address set with command Service Centre Address +CSCA is used; in this case the SMSC Type-of-Address octet shall not be present in the PDU, i.e.

©2004 BenQ Corporation. Confidential Property

TPDU starts right after SMSC length octet

- sending can be cancelled by giving <ESC> character (IRA 27)
- <ctrl-Z> (IRA 26) must be used to indicate the ending of PDU

Informative Examples

-Initial the HyperTerminal
-Initial the MS
-AT Command
AT+CMGS=?
OK
OK

Send Message from Storage +CMSS

Table: +CMSS Action Command Syntax (PDU)

Command	Possible response(s)
if text mode (+CMGF=0): +CMSS=<index>[,<da>[,<toda>]]	**If PDU mode (+CMGF=0) and sending successful:** +CMSS: <mr> **if sending fails:** +CMS ERROR: <err>

Description

Execution command sends message with location value <index> from preferred message storage <mem2> to the network (SMS-SUBMIT). If new recipient address <da> is given for SMS-SUBMIT, it shall be used instead of the one stored with the message. Reference value <mr> is returned to the TE on successful message delivery. If sending fails in a network or an ME error, final result code +CMS ERROR: <err> is returned. This command should be aborted.

Informative Examples

-Initial the HyperTerminal
-Initial the MS
-AT Command
AT+CMSS=8
+CMSS: 3
OK

©2004 BenQ Corporation. Confidential Property

Write Message to Memory +CMGW

Table: +CMGW Action Command Syntax (PDU)

Command	Possible response(s)
If PDU mode (+CMGF=0): +CMGW[=<length>[,<stat>]<CR> *PDU is given* <ctrl-Z/ESC>	+CMGW: <index> +CMS ERROR: <err>

Description

Execution command stores a message (either SMS-DELIVER or SMS-SUBMIT) to memory storage <mem2>. Memory location <index> of the stored message is returned. By default message status will be set to 'stored unsent', but parameter <stat> allows also other status values to be given. The entering of PDU is done similarly as specified in command Send Message +CMGS. If writing fails, final result code +CMS ERROR: <err> is returned.

Note: SMS-COMMANDs and SMS-STATUS-REPORTs cannot be stored in text mode.

Informative Examples

Reopen

2.3 Commands specified by ITU-T Rec. V25ter as by GSM Rec. 07.07

2.3.1 Generic TA control commands

Repeating a command line (A/)

If the prefix "A/" or "a/" is received (IA5 4/1, 2/15 or 6/1, 2/15), the DCE shall immediately execute once again the body of the preceding command line. No editing is possible, and no termination character is necessary. A command line may be repeated multiple times through this mechanism, if desired. Responses to the repeated command line shall be issued using the parity and format of the original command line, and the rate of the "A/". If "A/" is received before any command line has been executed, the preceding command line is assumed to have been empty (that results in an OK result code).

Information examples

Reset to default configuration (Z)

Table: Syntax (Z)

Command	Possible response(s)
Z	

Description

This command instructs the DCE to set all parameters to their factory defaults as specified by the manufacturer. This may include taking into consideration the settings of hardware configuration switches or non-volatile parameter storage (if implemented). If the DCE is connected to the line, it is disconnected from the line, terminating any call in progress.

All of the functions of the command shall be completed before the DCE issues the result code. The DTE should not include additional commands on the same command line after the Z command because such commands may be ignored.

NOTE – Because this command may take into consideration the settings of switches and non-volatile parameter storage, it does not necessarily return the DCE to a "known state". In particular, the DCE may, as a result of execution of this command, be placed in a state in which it appears to not respond to DTE commands, or respond in a completely different format than was being used prior to execution of the command.

Result codes

OK If<value> is recognized.

ERROR If<value> is not recognized or supported.

An OK result code for this command is issued using the same rate, parity, and format as the DTE command line containing the command, but using the new values for parameters that affect the format of result codes (e.g. Q, V, S3, S4).

Informative Examples

-Initial the HyperTerminal

-Initial the MS

-AT Command

ATZ

OK

ATZ0

©2004 BenQ Corporation. Confidential Property

OK

Set to factory-defined configuration (&F)

Table: Syntax (&F)

Command	Possible response(s)
&F	

Description

This command instructs the DCE to set all parameters to default values specified by the manufacturer, which may take into consideration hardware configuration switches and other manufacturer-defined criteria.

Defined values

0 set parameters to factory defaults.

(other) Reserved for manufacturer proprietary use.

Result codes

OK if value is valid.

ERROR if value is not recognized or not supported.

An OK result code for this command is issued using the same rate, parity, and format as the DTE command line containing the command, but using the factory-defined values for other parameters that affect the format of result codes (e.g. Q, V, S3, S4) and dependent upon other commands that may follow on the same command line.

Informative Examples

-Initial the HyperTerminal

-Initial the MS

-AT Command

AT&F

OK

AT&F0

OK

AT&F1

ERROR

AT&F2

©2004 BenQ Corporation. Confidential Property

EXT: I
ERROR

Request identification information (I)

Table: Syntax (I)

Command	Possible response(s)
I	

Description

This command causes the DCE to transmit one or more lines of information text, determined by the manufacturer, followed by a final result code. <value> may optionally be used to select from among multiple types of identifying information, specified by the manufacturer.

NOTE – The responses to this command may not be reliably used to determine the DCE manufacturer, revision level, feature set, or other information, and should not be relied upon for software operation. In particular, expecting a specific numeric response to an I0 command to indicate which other features and commands are implemented in a DCE dooms software to certain failure, since there are widespread differences in manufacturer implementation among devices that may, coincidentally, respond with identical values to this command. Software implementers should use I commands with extreme caution, since the amount of data returned by particular implementations may vary widely from a few bytes to several thousand bytes or more, and should be prepared to encounter ERROR responses if the value is not recognized.

Informative Examples

-Initial the HyperTerminal
-Initial the MS
-AT Command

1.
ATI
<manufacturer1>
OK
2.
ATI0
<manufacturer1>
OK

©2004 BenQ Corporation. Confidential Property

3.
ATI1
<manufacturer2>
OK
4.
ATI2
ERROR

Request manufacturer identification (+GMI)

Table: Syntax (+GMI)

Command	Possible response(s)
+GMI	

Description

This command causes the DCE to transmit one or more lines of information text, determined by the manufacturer, which is intended to permit the user of the DCE to identify the manufacturer. Typically, the text will consist of a single line containing the name of the manufacturer, but manufacturers may choose to provide more information if desired (e.g. address, telephone number for customer service, etc.).
The total number of characters. Including line terminators, in the information text returned in response to this command shall not exceed 2048 characters. Note that the information text shall not contain the sequence "0 <CR>" (3/0,0/13)or "OK<CR>" (4/15,4/11,0/13), so that DTE can avoid false detection of the this information text.

Result codes

OK In all cases.

Informative Examples

-Initial the HyperTerminal
-Initial the MS
-AT Command
AT+GMI=?
OK
AT+GMI?
ERROR
AT+GMI

©2004 BenQ Corporation. Confidential Property

<manufacturer>
OK

Request model identification (+GMM)

Table: Syntax (+GMM)

Command	Possible response(s)
+GMM	

Description

This command causes the DCE to transmit one or more lines of information text, determined by the manufacturer, which is intended to permit the user of the DCE to identify the specific model of device. Typically, the text will consist of a single line containing the name of the product, but manufacturers may choose to provide any information desired.

The total number of characters, including line terminators, in the information text returned in response to this command shall not exceed 2048 characters. Note that the information text shall not contain the sequence "0 <CR>" (3/0,0/13)or "OK<CR>" (4/15,4/11,0/13), so that DTE can avoid false detection of the this information text.

Result codes

OK in all cases

Informative Examples

-Initial the HyperTerminal
-Initial the MS
-AT Command
AT+GMM
<model>
OK

Request revision identification (+GMR)

Table: Syntax (+GMR)

Command	Possible response(s)
+GMR	

Description

This command causes the DCE to transmit one or more lines of information text, determined by the manufacturer, which is intended to permit the user of the DCE to identify the version, revision level or date, or other pertinent information of the device. Typically, the text will consist of a single line containing the version of the product, but manufacturers may choose to provide any information desired.
The total number of characters, including line terminators, in the information text returned in response to this command shall not exceed 2048 characters. Note that the information text shall not contain the sequence "0 <CR>" (3/0,0/13)or "OK<CR>" (4/15,4/11,0/13), so that DTE can avoid false detection of the this information text.

Result codes

OK in all cases

Informative Examples

-Initial the HyperTerminal
-Initial the MS
-AT Command
AT+GMR
<revision>
OK

Request product serial number identification (+GSN)

Table: Syntax (+GMM)

Command	Possible response(s)
+GSN	

Description

This command causes the DCE to transmit one or more lines of information text, determined by the manufacturer, which is intended to permit the user of the DCE to identify the individual device. Typically, the text will consist of a single line containing a manufacturer determined alpha-numeric string, but manufacturers may choose to provide any information desired.
The total number of characters, including line terminators, in the information text returned in response to this command shall not exceed 2048 characters. Note that the information text shall not contain the sequence "0 <CR>" (3/0,0/13)or "OK<CR>" (4/15,4/11,0/13), so that DTE can avoid false detection of the this

information text.

Result codes

OK in all cases

Informative Examples

-Initial the HyperTerminal

-Initial the MS

-AT Command

AT+GSN

<serial number>

OK

Request complete capabilities list (+GCAP)

Table: Syntax (+GCAP)

Command	Possible response(s)
+GCAP	

Description

This extended-format command causes the DCE to transmit one or more lines of information text in a specific format. The content is a list additional capabilities command +<name>s, which is intended to permit the user of the DCE to identify the overall capabilities of the DCE.

In particular, if the DCE implements a particular DCE control standard that uses Extended Syntax Commands, and if that DCE control standard includes command(s) that indicate general capabilities, the +<name>(s) of the those commands shall be reported to the DCE in response to a +GCAP command. See table.

Table V.25ter-Examples of required +GCAP responses

+GCAP response	DCE control standard	Description
+FCLASS	T.class1, +F Or T.class2, +F	Class1 Facsimile DCE Control Class2 Facsimile DCE Control

+MS	+M commands	Modulation Control: +MS and +MR commands
+MV18S	+MV18 commands	V.18 Modulation Control: +MV18S and +MV18R
+ES	+E commands	Error Control: +ES, +EB, +ER, +EFCS, +ETBM
+DS	+D commands	Data Compression: +DS and +DR

For example, a data modem that supported all capabilities described in this Recommendation may report:

+GCAP: +MS, +ES, +DS, +MV18S

If that example DCE implemented other commands, they shall also be included. If that DCE implemented stubs (e.g. +FCLASS=0 only), it may report +FCLASS as part of its +GCAP response.

The response is not specifically limited as to number of lines of text. Note that the information text shall not contain the sequence "0 <CR>" (3/0,0/13)or "OK<CR>" (4/15,4/11,0/13), so that DTE can avoid false detection of the end of the this information text.

It is not necessary for a DTE to inquire of the +GCAP where the application is specific to a technology, such as facsimile where the +FCLASS command would be sufficient to determine capabilities.

Informative Examples

-Initial the HyperTerminal

-Initial the MS

-AT Command

AT+GCAP

+GCAP:+FCLASS

OK

Command line termination character (S3)

Table: Syntax (S3)

Command	Possible response(s)
S3	

Description

This S-parameter represents the decimal IA5 value of the character recognized by the DCE from the DTE to terminate an incoming command line. It is also generated by the DCE as part of the header, trailer, and terminator for result codes and information text, along with the S4 parameter (see the description of the V parameter for usage).

The previous value of S3 is used to determine the command line termination character for entry of the command line containing the S3 setting command. However, the result code issued shall use the value of S3 as set during the processing of the command line. For example, if S3 was previously set to 13 and the command line ‘‘ATS3=30’’ is issued, the command line shall be terminated with a CR character (IA5 0/13), but the result code issued will use the character with the ordinal value 30 (IA5 2/14) in place of the CR.

Defined values

0 to 127 Set command line termination character to this value.

Mandatory default setting

13 Carriage return character (CR, IA5 0/13).

Information examples

-Initial the HyperTerminal

-Initial the MS

-AT Command

ATS3=?

S3(0-127)

OK

ATS3?

013

OK

Response formatting character (S4)

Table: Syntax (S4)

Command	Possible response(s)
S4	

Description

This S-parameter represents the decimal IA5 value of the character generated by

the DCE as part of the header, trailer, and terminator for result codes and information text, along with the S3 parameter (see the description of the V parameter for usage).
If the value of S4 is changed in a command line, the result code issued in response to that command line will use the new value of S4.

Defined values

0 to **127** Set response formatting character to this value.

Recommended default setting

10 Line feed character (LF, IA5 0/10).

Information examples

-Initial the HyperTerminal
-Initial the MS
-AT Command
ATS4=?
S4(0-127)
OK
ATS4?
010
OK

Command line editing character (S5)

Table: Syntax (S5)

Command	Possible response(s)
S5	

Description

This S-parameter represents the decimal IA5 value of the character recognized by the DCE as a request to delete from the command line the immediately preceding character (see 5.2.2).

Defined values

0 to **127** Set command line editing character to this value.

Recommended default setting

8 Backspace character (BS, IA5 0/8).

Information examples

-Initial the HyperTerminal
-Initial the MS
-AT Command
ATS5=?
S5(0-127)
OK
ATS5?
008
OK

Command echo (E)

Table: Syntax (E)

Command	Possible response(s)
E[<value>]	

Description

The setting of this parameter determines whether or not the DCE echoes characters received from the DTE during command state and online command state.

Defined values

0 DCE does not echo characters during command state and online command state.
1 DCE echoes characters during command state and online command state.

Recommended default setting

1 DCE echoes characters during command state and online command state.

Information examples

-Initial the HyperTerminal
-Initial the MS
-AT Command
ATE1
OK
<Display the response on the HyperTerminal>

ATE0
OK
[command]
OK

Result code suppression (Q)

Table: Syntax (Q)

Command	Possible response(s)
Q[<value>]	

Description

The setting of this parameter determines whether or not the DCE transmits result codes to the DTE. When result codes are being suppressed, no portion of any intermediate, final, or unsolicited result code – header, result text, line terminator, or trailer – is transmitted. Information text transmitted in response to commands is not affected by the setting of this parameter.

Defined values

0 DCE transmits result codes.

1 Result codes are suppressed and not transmitted.

Recommended default setting

0 DCE transmits result codes.

Result codes

OK If value is 0.

(none) If value is 1 (because result codes are suppressed).

ERROR For unsupported values (if previous value was Q0).

(none) For unsupported values (if previous value was Q1)

Information examples

-Initial the HyperTerminal
-Initial the MS
-AT Command
ATQ0
OK
ATQ?
Q: 0

©2004 BenQ Corporation. Confidential Property

OK
ATQ1
ATQ?
Q: 1
[none]
AT+CFUN?
+CFUN: 1
[none]

DCE response format (V)

Table: Syntax (V)

Command	Possible response(s)
V[<value>]	

Description

The setting of this parameter determines the contents of the header and trailer transmitted with result codes and information responses. It also determines whether result codes are transmitted in a numeric form or an alphabetic (or "verbose") form. The text portion of information responses is not affected by this setting.

Table 3 shows the effect of the setting of this parameter on the format of information text and result codes. All references to cr mean "the character with the ordinal value specified in parameter S3"; all references to lf likewise mean "the character with the ordinal value specified in parameter S4". See Table 3.

Table 3/V.25 *ter* – Effect of V parameter on response formats

	V0	**V1**
Information responses	**<text><cr><lf>**	**<cr><lf>** **<text><cr><lf>**
Result codes	**<numeric code><cr>**	**<cr><lf>** **<verbose code><cr><lf>**

Defined values

0 DCE transmits limited headers and trailers and numeric text.

1 DCE transmits full headers and trailers and verbose response text.

Recommended default setting

1 DCE transmits full headers and trailers and verbose response text.

Result codes

0 If value is 0 (because numeric response text is being used).
OK If value is 1.
4 For unsupported values (if previous value was V0).
ERROR For unsupported values (if previous value was V1).

Information examples

-Initial the HyperTerminal
-Initial the MS
-AT Command

1.
AT+CFUN? -> +CFUN: 1
0
ATV? -> V: 0
0

2.
ATV?
V: 1
OK
AT+CFUN?
+CFUN: 1
OK

Result code selection and call progress monitoring control (X)

Table: Syntax (X)

Command	Possible response(s)
X[<value>]	

Description

The setting of this parameter determines whether or not the DCE transmits particular result codes to the DTE. It also controls whether or not the DCE verifies the presence of dial tone when it first goes off-hook to begin dialling, and whether or not engaged tone (busy signal) detection is enabled. However, this setting has no effect on the operation of the W dial modifier, which always checks for dial tone

©2004 BenQ Corporation. Confidential Property

regardless of this setting, nor on the busy signal detection capability of the W and @ dial modifiers. See Table 4.

Table 4/V.25 *ter* – Defined values for X parameter

X<value>	Description
0	**CONNECT** result code is given upon entering online data state. Dial tone and busy detection are disabled.
1	**CONNECT <text>** result code is given upon entering online data state. Dial tone and busy detection are disabled.
2	**CONNECT <text>** result code is given upon entering online data state. Dial tone detection is enabled, and busy detection is disabled.
3	**CONNECT <text>** result code is given upon entering online data state. Dial tone detection is disabled, and busy detection is enabled.
4	**CONNECT <text>** result code is given upon entering online data state. Dial tone and busy detection are both enabled.

Information examples

-Initial the HyperTerminal

-Initial the MS

-AT Command

1.

ATX0

OK

2.

ATX1

OK

3.

ATX2

OK

4.

ATX3

OK

5.

ATX4

OK

©2004 BenQ Corporation. Confidential Property

Circuit 109 (Received line signal detector) behavior (&C)

Table: Syntax (&C)

Command	Possible response(s)
&C[<value>]	

Description

This parameter determines how the state of circuit 109 relates to the detection of received line signal from the distant end. Changing the parameter will take effect immediately in both the command and online command states.

In &C1 mode of operation, circuit 109 is not turned off until all data previously received from the remote DCE is delivered to the local DTE. However, such buffered data shall be discarded and circuit 109 turned off if the DTE turns off circuit 108 (if &D1 or &D2 is set).

Defined values

0 The DCE always presents the ON condition on circuit 109.

1 Circuit 109 changes in accordance with the underlying DCE, which may include functions other than the physical layer functions (e.g.Recommendations V.42, V.110, V.120 and V.13).

Recommended default setting

1 Circuit 109 changes in accordance with the underlying DCE, which may include functions other than the physical layer functions (e.g. Recommendations V.42, V.110, V.120 and V.13).

Information examples

-Initial the HyperTerminal

-Initial the MS

-AT Command

AT&C1

OK

AT&C0

OK

Circuit 108 (Data terminal ready) behavior (&D)

Table: Syntax (&D)

Command	Possible response(s)

©2004 BenQ Corporation. Confidential Property

&D[<value>]	

Description

This parameter determines how the DCE responds when circuit 108/2 is changed from the ON to the OFF condition during online data state.

Defined values

0 DCE ignores circuit 108/2.

1 Upon an on-to-off transition of circuit 108/2, the DCE enters online command state and issues an OK result code; the call remains connected.

2 Upon an on-to-off transition of circuit 108/2, the DCE instructs the underlying DCE to perform an orderly cleardown of the call. The disposition of any data in the DCE pending transmission to the remote DCE is controlled by the ETBM parameter (see 6.5.6) if implemented; otherwise, this data is sent before the call is cleared, unless the remote DCE clears the call first (in which case pending data is discarded). The DCE disconnects from the line. Automatic answer is disabled while circuit 108/2 remains off.

Information examples

-Initial the HyperTerminal

-Initial the MS

-AT Command

AT&D?

&D: 0

OK

AT&D1

OK

AT&D?

&D: 1

OK

AT&D2

ERROR

Fixed DTE rate (+IPR)

Table: Syntax (+IPR)

Command	Possible response(s)
+IPR=<rate>	
+IPR?	Read syntax
+IPR: <rate>	Read syntax
+IPR=?	Test syntax
+IPR:(list of supported autodetectable<rate> values)[,(list of fixed-only <rate> values)]	Test syntax

Description

This numeric extended-format parameter specifies the data rate at which the DCE will accept commands, in addition to 1200 bit/s or 9600 bit/s (as required in 4.3). It may be used to select operation at rates at which the DCE is not capable of automatically detecting the data rate being used by the DTE. Specifying a value of 0 disables the function and allows operation only at rates automatically detectable by the DCE. The specified rate takes effect following the issuance of any result code(s) associated with the current command line.

The rate specified does not apply in OnLine Data State if Direct mode of operation is selected.

Defined values

The rate value specified shall be the rate in bits per second at which the DTE-DCE interface should operate, e.g. "19 200" or "115 200". The rates supported by a particular DCE are manufacturer-specific; however, the +IPR parameter should permit the setting of any rate supported by the DCE during online operation. Rates which include a non-integral number of bits per second should be truncated to the next lower integer (e.g. 134.5 bit/s should be specified as 134; 45.45 bit/s should be specified as 45). If unspecified or set to 0, automatic detection is selected for the range determined by 4.3 and the DCE manufacturer, and the character format is also forced to autodetect, +ICF 0 (see 6.2.11).

Recommended default setting

It is recommended that the default for this parameter be the automatic detection setting (0), which facilitates initial DTE-DCE communications.

©2004 BenQ Corporation. Confidential Property

Information examples

-Initial the HyperTerminal

-Initial the MS

-AT Command

AT+IPR=?

+IPR:(),(75,150,300,600,1200,2400,4800,7200,9600,14400,19200,28800,33900,38400,57600,115200)

OK

AT+IPR?

+IPR: 115200

OK

DTE-DCE character framing (+ICF)

Table: Syntax (+ICF)

Command	Possible response(s)
+ICF=[<format>[,<parity>]]	
+ICF?	
+ICF:<format>,<parity>	
+ICF=?	
+ICF:(list of supported <format> values),(list of supported <parity> values)	

Description

This extended-format compound parameter is used to determine the local serial port start-stop (asynchronous) character framing that the DCE shall use while accepting DTE commands and while transmitting information text and result code, if this is not automatically determined;. IPR 0 forces. ICF 0 (see. IPR, 6.2.10). Note that the definition of fixed character format for OnLine Data State is for further study.

format determines the number of bits in the data bits, the presence of a parity bit, and the number of stop bits in the start-stop frame.

<**parity**> determines how the parity bit is generated and checked, if present.

Defined values

See Table 5.

Table 5/V.25 *ter* – Character format values

<format>	Valid numeric values
0	auto detect
1	8 Data 2 Stop
2	8 Data 1 Parity 1 Stop
3	8 Data 1 Stop
4	7 Data 2 Stop
5	7 Data 1 Parity 1 Stop
6	7 Data 1 Stop
<parity>	**Defined numeric values**
0	Odd
1	Even
2	Mark
3	Space

Recommended default setting

For <format>: **3**

For <parity>: **3**

Information examples

-Initial the HyperTerminal

-Initial the MS

-AT Command

AT+ICF=?

+ICF: (1-6),(0-3)

OK

AT+ICF?

+ICF: 3

OK

AT+ICF=1

OK

AT+ICF?

+ICF: 1

OK

©2004 BenQ Corporation. Confidential Property

DTE-DCE local flow control (+IFC)

Table: Syntax (+IFC)

Command	Possible response(s)
IFC [DCE_by_DTE [, DTE_by_DCE]]	
IFC?	Read syntax
IFC: DCE_by_DTE , DTE_by_DCE	Read Syntax
IFC ?	Test syntax
IFC:(list of supported DCE_by_DTE values),(list of supported DTE_by_DCE values)	Test syntax

Description

This extended-format compound parameter is used to control the operation of local flow control between the DTE and DCE during the data state when V.42 error control is being used, or when fallback to non-error control mode is specified to include buffering and flow control. It accepts two numeric subparameters:

– **<DCE_by_DTE>**, which specifies the method to be used by the DTE to control the flow of received data from the DCE; and

– **<DTE_by_DCE>**, which specifies the method to be used by the DCE to control the flow of transmitted data from the DTE.

Defined values

See Table 6.

Table 6/V.25 *ter* – <DCE_by_DTE> and <DTE_by_DCE> values

DCE_by_DTE	Description
0	None
1	DC1/DC3 on circuit 103; do not pass DC1/DC3 characters to the remote DCE
2	Circuit 133 (Ready for Receiving)

©2004 BenQ Corporation. Confidential Property

3	DC1/DC3 on circuit 103 with DC1/DC3 characters being passed through to the remote DCE in addition to being acted upon for local flow control
4 to 127	Reserved for future standardization
Other	Reserved for manufacturer-specific use
DTE_by_DCE	Description
0	None
1	DC1/DC3 on circuit 104
2	Circuit 106 (Clear to Send/Ready for Sending)
3 to 127	Reserved for future standardization
Other	Reserved for manufacturer-specific use
NOTE – DC1 is IA5 1/1; DC3 is IA5 1/3.	

Recommended default setting

For <DCE_by_DTE>: **2**

For <DTE_by_DCE>: **2**

Information examples

-Initial the HyperTerminal

-Initial the MS

-AT Command

AT+IFC=?

+IFC: (0-2),(0-2)

OK

AT+IFC?

+IFC: 2,2

OK

AT+IFC=0,0

OK

AT+IFC?

+IFC: 0,0

OK

DTE-DCE local rate reporting (+ILRR)

Table: Syntax (+ILRR)

Command	Possible response(s)

ILRR=<value>	
ILRR?	ILRR:current setting
ILRR=?	ILRR:(list of supported values)

Description

This extended-format numeric parameter controls whether or not the extended-format "ILRR: rate" information text is transmitted from the DCE to the DTE. The rate reported shall represent the current (negotiated or renegotiated) DTE-DCE rate. If enabled, the intermediate result code is transmitted after any modulation, error control or data compression reports are transmitted, and before any final result code (e.g. CONNECT) is transmitted. The rate is applied after the final result code is transmitted.

The DTE-DCE port rate will change only if neither buffered mode nor error-controlled means are enabled (ES x,0) and if the negotiated carrier rate (MRR) does not match the current DTE-DCE port rate (set by IPR command or autodetected from the previous command line).

The format of this intermediate result code is:

ILRR: rate [,rx_rate] e.g. ILRR: 19 200

<rate> values are decimal values. The optional <rx_rate> value reports the rate on circuit 104 (RXD), if it is different from the rate on circuit 103 (TXD).

Defined values

See Table 7.

Table 7/V.25 *ter* – Local port rate reporting values

<value	Description
0	Disables reporting of local port rate (+ILRR: is not transmitted)
1	Enables reporting of local port rate (+ILRR: is transmitted)

Recommended default setting

0

Information examples

-Initial the HyperTerminal

-Initial the MS

-AT Command

AT+ILRR=?
+ILRR: (0,1)
OK
AT+ILRR?
+ILRR: 0
OK
AT+ILRR=1
OK
AT+ILRR?
+ILRR: 1
OK

2.3.2 Call Control commands and response

Dial (D)

Table: Syntax (D)

Command	Possible response(s)
D[<dial_string>][;]	

Description

This command instructs the DCE to originate a call. This may include several steps, depending upon the DCE type, such as: connecting to the line (going off-hook), waiting for the network to indicate readiness to receive call addressing information (wait for dial tone), signaling call addressing information to the network (dialling the number), monitoring the line for call progress signals (e.g. busy), and instructing the underlying DCE to start the call origination procedure (modulation handshaking).

All characters appearing on the same command line after the "D" are considered part of the call addressing information to be signaled to the network, or modifiers used to control the signaling process (collectively known as a "dial string"), up to a semicolon character (IA5 3/11) or the end of the command line. If the dial string is terminated by a semicolon, the DCE does not start the call origination procedure as defined for the underlying DCE, but instead returns to command state after completion of the signaling of call addressing information to the network.
Any characters appearing in the dial string that the DCE does not recognize as a valid part of the call addressing information or as a valid modifier shall be ignored. This permits characters such as parentheses and hyphens to be included that are

typically used in formatting of telephone numbers.

Abortability

The D command may be aborted in the manner described in 5.6.1. If the DCE is connected to the line, it disconnects from the line in an orderly manner as required by the state of the connection. Aborting the connection by reception of a character is generally possible at any time before the DCE enters online data state, but may not be possible during some states of connection establishment such as handshaking. The DCE shall issue a final result code; which result code to issue shall be determined by the manufacturer, and may depend upon the state of the connection at the time the character was received from the DTE. If a CONNECT or CONNECT text result code is received by the DTE, this indicates that the attempt to abort the command was not successful, possibly due to the state of connection establishment at the time the character was sent. See Table 8.

Table 8/V.25 *ter* – D command result codes

Alphabetic (ATV1)	Numeric (ATV0)	Description
CONNECT	1	If connection is successfully established and X0 is selected. This result code is transmitted immediately before circuit 109 is turned on
CONNECT <text>	–	If connection is successfully established and Xn is selected where "n" is any value other than 0. This result code is transmitted immediately before circuit 109 is turned on. The contents of text are manufacturer-specific, and may include indication of DTE interface speed, line speed, error control and data compression techniques in use, and other information
NO CARRIER	3	If a connection cannot be established, or was aborted by reception of an additional character from the DTE
ERROR	4	If issued while in online command state
BUSY	7	If busy signal detection is enabled or the W or @ dial modifier is used, and a busy signal is detected

©2004 BenQ Corporation. Confidential Property

Alphabetic (ATV1)	Numeric (ATV0)	Description
NO ANSWER	8	If the "@" dial modifier is used, and remote ringing followed by five seconds of silence is not detected before the expiration of the connection timer defined by S7
NO DIALTONE	6	If dial tone detection is enabled or the W dial modifier is used, and no dial tone is detected within the associated timeout period
OK	0	If command is aborted by either reception of an additional character from the DTE or by the DTE turning off circuit 108 (if &D1 or &D2 is selected; see 6.2.9), or if the dial string is terminated by a semicolon character

Information examples

-Initial the HyperTerminal

-Initial the MS

-AT Command

ATD0921214863;

OK

NO CARRIER

OK

Wait for dial tone (W)

Table: Syntax (W)

Command	Possible response(s)
W	

Description

Causes the DCE to listen for dial tone on the line. If a valid dial tone is detected, the DCE continues processing the remainder of the dial string.

If the DCE decides to abort dialling because the dial tone does not occur within the connection timeout period specified by parameter S7, the NO DIALTONE or NO CARRIER result code is issued and the remainder of the command line is ignored.

©2004 BenQ Corporation. Confidential Property

The DCE may, but is not required to, detect busy signal while listening for dial tone; this capability may be conditioned upon the setting of the X command. The BUSY or NO CARRIER result codes may be issued if the DCE detects a busy signal while listening for dial tone; in this event, the remainder of the command line is ignored.

Information examples

-Initial the HyperTerminal
-Initial the MS
-AT Command
ATW
OK

Select tone dialling (dial modifier) (T)

Table: Syntax (T)

Command	Possible response(s)
T	

Description

Causes subsequent dial digits to be signalled using DTMF. The effect of the T modifier may carry forward to subsequent D commands (i.e. once a T dial modifier is used, all subsequent dialling uses DTMF tones until a P dial modifier or command is issued); however, it is recommended that the DTE explicitly specify pulse or DTMF dialling with the appropriate dial modifier (P or T) at the beginning of each dial string.

Information examples

-Initial the HyperTerminal
-Initial the MS
-AT Command
ATT
OK

Select pulse dialing (dial modifier) (P)

Table: Syntax (P)

Command	Possible response(s)
P	

©2004 BenQ Corporation. **Confidential Property**

Description

Causes subsequent dial digits to be signalled using pulse dialling. The effect of the P modifier may carry forward to subsequent D commands (i.e. once a P dial modifier is used, all subsequent dialling uses pulse dialling until a T dial modifier or command is issued); however, it is recommended that the DTE explicitly specify pulse or DTMF dialling with the appropriate dial modifier (P or T) at the beginning of each dial string.

Information examples

-Initial the HyperTerminal
-Initial the MS
-AT Command
ATP
OK

Answer (A)

Table: Syntax (A)

Command	Possible response(s)
A	

Description

This command instructs the DCE to immediately connect to the line and start the answer sequence as specified for the underlying DCE.

Any additional commands that appear after A on the same command line are ignored.

Abortability

The A command may be aborted in the manner described in 5.6.1. If the DCE is connected to the line, it disconnects from the line in an orderly manner as required by the state of the connection. Aborting the connection by reception of a character is generally possible at any time before the DCE enters online data state, but may not be possible during some states of connection establishment, such as handshaking. The DCE shall issue a final result code; which result code to issue shall be determined by the manufacturer, and may depend upon the state of the connection at the time the character was received from the DTE. If a CONNECT or CONNECT text result code is received by the DTE, this indicates that the

©2004 BenQ Corporation. Confidential Property

attempt to abort the command was not successful, possibly due to the state of connection establishment at the time the character was sent. See Table 9.

Table 9/V.25 *ter* – A command result codes

Alphabetic (ATV1)	Numeric (ATV0)	Description
CONNECT	1	If connection is successfully established and **X0** is selected. This result code is transmitted immediately before circuit 109 is turned on
CONNECT <text>	–	If connection is successfully established and **Xn** is selected where "**n**" is any value other than 0. This result code is transmitted immediately before circuit 109 is turned on. The contents of **<text>** are manufacturer-specific, and may include indication of DTE interface speed, line speed, error control and data compression techniques in use, and other information
NO CARRIER	3	If a connection cannot be established, or was aborted by reception of an additional character from the DTE
ERROR	4	If issued while in online command state
OK	0	If command is aborted by either reception of an additional character from the DTE or by the DTE turning off circuit 108 (if &D1 or &D2 is selected; see 6.2.9), or if the dial string is terminated by a semicolon character

Hook control (H)

Table: Syntax (H)

Command	Possible response(s)
H[<value>]	

Description

This command instructs the DCE to disconnect from the line, terminating any call in progress. All of the functions of the command shall be completed before the DCE issues any result code.

Abortability

This action may not be aborted.

Defined values

0 Disconnect from line and terminate call.

Result codes

OK The result code is issued after circuit 109 is turned off, if it was previously on.

ERROR If **<value>** is not recognized or supported.

Information examples

-Initial the HyperTerminal

-Initial the MS

-AT Command

ATH

OK

Automatic answer (S0)

Table: Syntax (S0)

Command	Possible response(s)
S0	

Description

This S-parameter controls the automatic answering feature of the DCE. If set to 0, automatic answering is disabled. If set to a non-zero value, the DCE shall cause the DCE to answer when the incoming call indication (ring) has occurred the number of times indicated by the value (see 6.1.2). For example, in GSTN modem applications, setting this parameter to 1 will cause the modem to answer an incoming call on the first ring.

Defined values

0 Automatic answering is disabled.

1 to **255** Enable automatic answering on the ring number specified.

Recommended default setting

0 Automatic answering is disabled.

Information examples

-Initial the HyperTerminal

-Initial the MS

-AT Command

ATS0=?

©2004 BenQ Corporation. Confidential Property

S0(0-255)
OK
ATS0?
000
OK
ATS0=1
OK
ATS0?
001
OK

Monitor speaker loudness (L)

Table: Syntax (L)

Command	Possible response(s)
L[<value>]	

Description

This parameter controls the volume of the monitor speaker. The specific loudness level indicated by "low", "medium", and "high" is manufacturer-specific, although they are intended to indicate increasing volume.

Defined values

See Table 11.

Table 11/V.25 *ter* – Speaker loudness values

<value>	Description
0	Low speaker volume
1	Low speaker volume
2	Medium speaker volume
3	High speaker volume

Information examples

-Initial the HyperTerminal
-Initial the MS
-AT Command
ATL0

OK
ATL1
OK
ATL2
OK
ATL3
OK

2.3.3 Data Compression commands

Data compression (DS)

Table: Syntax (+DS)

Command	Possible response(s)
+DS=[<direction>[,<compression_negotiation>[,<max_dict>[,<max_string>]]]]	
+DS?	Read syntax
+DS=<direction>,<compression_negotiation>,<max_dict>,<max_string>	Read syntax
DS?	Test syntax
+DS: (list of supported <direction> values), (list of supported <compression_negotiation> values), (list of supported <max_dict> values), (list of supported <max_string> values)	Test syntax

Description

This extended-format compound parameter controls the V.42 bis data compression function if provided in the DCE. It accepts four numeric subparameters:

– direction , which specifies the desired direction(s) of operation of the data compression function; from the DTE point of view;

– compression_negotiation , which specifies whether or not the DCE should continue to operate if the desired result is not obtained;

– max_dict , which specifies the maximum number of dictionary entries which should be negotiated (may be used by the DTE to limit the codeword size

©2004 BenQ Corporation. Confidential Property

transmitted, based on its knowledge of the nature of the data to be transmitted);

– max_string , which specifies the maximum string length to be negotiated (V.42 bis P2).

Defined values

See Table 26.

Table 26/V.25 *ter* – Data compression control subparameters

<direction>:	**Description**
0	Negotiated ... no compression (V.42 *bis* P0 = 0)
1	Transmit only
2	Receive only
3	Both directions, accept any direction (V.42 *bis* P0 = 11)
<compression_negotiation>	**Description**
0	Do not disconnect if Rec. V.42 *bis* is not negotiated by the remote DCE as specified in <direction>
1	Disconnect if Rec. V.42 *bis* is not negotiated by the remote DCE as specified in <direction>
<max_dict>:	**512** to **65535**
<max_string>:	**6** to **250**

Recommended default settings

For direction : 3

For compression_negotiation : 0

For max_dict : Determined by the manufacturer

For max_string : 6

Information examples

None support

Data compression reporting (DR)

Table: Syntax (+DR)

Command	Possible response(s)
+DR=<value>	

+DR?	Read syntax
+DR: <current setting>	Read syntax
+DR=?	Test syntax
+DR: (list of supported values)	Test syntax

Description

This extended-format numeric parameter controls whether or not the extended-format "+DR:" intermediate result code is transmitted from the DCE to the DTE. The +DR:<type> reported shall represent the current (negotiated or renegotiated) DCE-DCE data compression type. If enabled, the intermediate result code is transmitted at the point after error control negotiation (handshaking) at which the DCE has determined which data compression technique will be used (if any) and the direction of operation. The format of this result code is the following (see Table 27):

Table 27/V.25 *ter* – Data compression reporting intermediate result codes

+DR: NONE	Data compression is not in use
+DR: V42B	Rec. V.42 *bis* is in use in both directions
+DR: V42B RD	Rec. V.42 *bis* is in use in receive direction only
+DR: V42B TD	Rec. V.42 *bis* is in use in transmit direction only

The +DR intermediate result code, if enabled, is issued after the Error Control Report (+ER) and before the final result code (e.g. CONNECT).

Defined values

See Table 28.

Table 28/V.25 *ter* – Data compression reporting values

<value>	Description
0	Data compression reporting disabled (no +DR result code transmitted)
1	Data compression reporting enabled (+DR result code transmitted)

Recommended default setting

0

Information examples

-Initial the HyperTerminal

-Initial the MS

-AT Command

AT+DR?

+DR: 0

OK

AT+DR=1

OK

AT+DR?

+DR: 1

OK

2.4 Command specified by ITU-T Rec. T.32

2.4.1 Action commands

Send a page +FDT

Command	Possible response(s)
+FDT<CR>	[<CR><LF>+FNF:<NSF FIF data>] [<CR><LF>+FCI:<remote ID>] [<CR><LF>+FIS:<parameters>] [<CR><LF>+FCS:<parameters>] CONNECT +FHS:<hangup code><CR><LF>OK ERROR

Description

The FDT command requests the DCE to transmit a Phase C page. It is issued at the beginning of each page, either in Phase B or in Phase D. When the DCE is ready to accept Phase C data, it shall issue the negotiation responses and the CONNECT result code to the DTE. Negotiation responses are controlled by the FNR subparameters (8.5.1.11/T.32).

In Phase B (after ATA, ATD or the end of a document), the FDT command releases the DCE to proceed with negotiation and release the DCS message to the remote station. In Phase D (after sending a page), the FDT command resumes transmission after the end of a previous page.

The FDT command results in a CONNECT result code response if the DCE is ready for data, or another result code if not (e.g. FHS:<hangup code>). Following the CONNECT message, the DTE shall deliver image data to the DCE as negotiated. After image data is delivered, the DTE shall deliver a <DLE><ppm> character pair (8.3.3.7/T.32) to mark the end of the data and to indicate subsequent actions.

The FDT command results in an ERROR result code response if the DCE is on-hook.

Informative examples

-Initial the HyperTerminal

-Initial the MS

©2004 BenQ Corporation. Confidential Property

-AT Command
AT+FDT
+FCS:0,3,0,0,0,0,2,0
CONNECT

Receive a page +FDR

Command	Possible response(s)
+FDR<CR>	<CR><LF>+FNC:<NSC FIF data>] [<CR><LF>+FTI:<remote ID>] [<CR><LF>+FCS:<parameters>] CONNECT +FHS:<hangup code><CR><LF>OK ERROR

Description

The FDR command initiates transition to Phase C data reception. This can occur after answering, after dialling, after a document is received, or after a page is received.

The DCE may report the negotiated T.30 parameters, with the remote ID and NSS frame information if available. When the DCE is ready to commence data transfer, it shall issue a CONNECT response code. After the DTE receives the CONNECT response and the DTE is ready to accept data, it shall issue a <DC2> character (T.50 1/2) to the DCE.

From the FDR command until the end of Phase C Data, the DCE is in a data transfer state and shall not respond to DTE command lines. The DCE shall respond to four T.50 control characters: <DC1> (1/1) and <DC3> (1/3) flow control characters, <CAN> (1/8) (8.3.4.6/T.32) and to <"?"> (3/15) (8.3.4.7/T.32); all other characters are discarded.

When the DCE delivers the last octet of a page, indicated by the <DLE><ETX> stream termination sequence, the DCE shall report the Page Status via the FPS:<ppr> response, described in 8.4.3. The Page Status is also stored in the FPS parameter (8.5.2.2/T.32). The <ppr> response codes are described in Table 18.

After a Page Status report, the DCE shall report the post page message

from the remote facsimile station via the FET:<ppm> response (8.4.4.1/T.32), which signals the intentions of the remote station. <ppm> response codes are described in Table 19.

The DCE shall use the <ppr> code stored in the FPS parameter to determine the Post Page response to the remote facsimile station. The DTE may modify the FPS parameter before issuing the FDR command, which releases that message. The DTE must issue a FDR command to release Post Page Messages.

The FDR command shall result in an ERROR result code if the DCE is on-hook or if the capability to receive is missing or disabled (FCR0, 8.5.1.9/T.32).

Informative examples

-Initial the HyperTerminal
-Initial the MS
-AT Command
AT+FDR
+FCS:0,3,0,0,0,0,2,0
CONNECT

Terminate a session +FKS

Command	Possible response(s)
+FKS<CR>	FHS:<hangup code><CR><LF>OK OK

Description

The FKS command causes the DCE to terminate the session in an orderly manner. In particular, it will send a DCN message at the next opportunity and hang up. At the end of the termination process, the DCE shall report the FHS response with result code, defined in 8.4.5, go On-Hook and, if FCLASS0 is supported, set FCLASS0.

The DTE may also invoke this operation using the T.50 <CAN> (Cancel, T.50 1/8) character during Phase C data reception (see 8.3.4.7/T.32).

If the DTE issues this command while the DCE is On-Hook, the DCE shall report OK.

©2004 BenQ Corporation. Confidential Property

Initialize facsimile parameters +FIP

Command	Possible response(s)
+FIP[=<value>]<CR>	OK ERROR

Description

The FIP command causes the DCE to initialize all Service Class 2 Facsimile Parameters to the manufacturer determined default settings. This command does not change the setting of FCLASS. This command has the same effect as if the DTE had issued individual parameter setting commands.

Manufacturers may also provide a selection of default profiles, chosen by the optional <value>. If <value> is unspecified or 0, the parameters shall be set to those specified in Recommendation T.32 (e.g. Appendix I). For other <value>s, the manufacturer determines the profile settings.

This command may be issued during a session. The DCE shall use the new settings at the next time they are sampled; for example, a new FIS setting would be used the next time the DCE enters Phase B.

Defined values

<value>: optional default profiles are not support

Informative examples

-Initial the HyperTerminal
-Initial the MS
-AT Command
AT+FIP
OK

2.4.2 DCE Responses

Facsimile Connection +FCO

Response	Possible command(s)
+FCO	ATD ATA

Description

The FCO response indicates connection with a Group 3 facsimile station. The DCE shall deliver this message to the DTE upon detection of HDLC flags in the first received frame, in execution of Originate commands (8.3.1/T.32) or Answer commands (8.3.2/T.32) only.

Defined values

<value>: optional default profiles are not support

Informative examples

-Initial the HyperTerminal

-Initial the MS

-AT Command

ATA

+FCO

Report DCS Frame Information +FCS

Response	Possible command(s)
+FCS: <VR>, , <WD>, <LN>, <DF>, <EC>, <BF>, <ST>, <JP>	ATD ATA +FDT +FDR

Description

+FCS:<subparameter string> reports negotiated parameters. Phase C data will be formatted as reported by these subparameters. +FDT or +FDR command execution may generate these responses, before the CONNECT result code, if new DCS frames are generated or received.

Defined values

<VR>: Resolution

00: R8 x 3.85 l/mm, Normal

01: R8 x 7.7 l/mm, Fine

02: R8 x 15.4 l/mm

04: R16 x 15.4 l/mm

08: 200dpi x 100 l/25.4 mm

©2004 BenQ Corporation. Confidential Property

10: 200dpi x 200 l/25.4 mm

20: 200dpi x 400 l/25.4 mm

40: 300dpi x 300 l/25.4 mm

: Bit Rate

0: 2400 bit/s

1: 4800 bit/s

2: 7200 bit/s

3: 9600 bit/s

4: 12000 bit/s

5: 14400 bit/s

<WD>: Page Width in pixels

0: 1728 (R8 d/mm), 3456 (R16 d/mm), 1728 (200 dpi), 2592 (300 dpi), 3456 (400 dpi)

1: 2048 (R8 d/mm), 4096 (R16 d/mm), 2048 (200 dpi)

2: 2432 (R8 d/mm), 4864 (R16 d/mm), 2432 (200 dpi)

<LN>: Page Length

0: A4, 297 mm

1: B4, 364 mm

2: unlimited length

<DF>: Data Compression

0: 1-D Modified Huffman (T.4)

<EC>: Error Correction

0: Disable ECM

<BF>: File Transfer

00: Disable file transfer modes

<ST>: Scan Time/Line

0: 0 ms (VR=0), 0 ms (VR>0)

1: 5 ms (VR=0), 5 ms (VR>0)

2: 10 ms (VR=0), 5 ms (VR>0)

3: 10 ms (VR=0), 10 ms (VR>0)

4: 20 ms (VR=0), 10 ms (VR>0)

5: 20 ms (VR=0), 20 ms (VR>0)

6: 40 ms (VR=0), 20 ms (VR>0)

7: 40 ms (VR=0), 40 ms (VR>0)

<JP>: JPEG for colour and B&W

00: Disable JPEG coding

Notes

1. For subparameter VR, values 00, 01, 02, 04, 08, 10, 20 and 40 (hexadecimal) indicate a single choice; they are the only values allowed in the FCS parameter and FCS: report. All other values which are sums of these values shall only be used to indicate multiple capabilities; these are allowed in FIS and FCC parameters. For example, value 07 (01 02 04) would indicate capability for all metric-based resolutions. Values higher than 7Fh are reserved for future study.

2. Recommendation T.30 does not provide for the answering station to specify all speeds exactly using the DIS frame. Implementation of some BR codes (e.g. code 2) by an answering DCE is manufacturer specific. Values higher than 5 are reserved for future modulations.

3. For subparameter BF, values 00, 01, 02, 04, 08, 10, 20 and 40 (hexadecimal) indicate a single choice; they are the only values allowed in the FCS parameter and FCS: report. All other values which are sums of these values shall only be used to indicate multiple capabilities; these are allowed in FIS and FCC parameters. For example, to indicate support for BFT, character mode and mixed modes, the DTE should set the BF subparameter to 01 10 20 31. Values higher than 7F are reserved for future study.

4. For each subparameter JP, values 00, 01, 02, 04 08, 10, 20 and 40 (hexadecimal) indicate a single choice. All other values which are sums of these values shall be used to indicate multiple capabilities in FIS and FCC subparameters and to indicate the choice in FCS subparameters. For example, to indicate support for JPEG, full color mode and no subsampling, the DTE should set the JP subparameter to 01 02 10 13. If one or several of the values 02 up to 40 are not used, that means that the default value for the subparameter (e.g. respectively: gray-scale, custom Huffman tables, 8 bit/pel/component, 4:1:1 subsampling ratio, D50 illuminant, default gamut range) is used, as defined in Annex E/T.30 and Annex G/T.4.

Informative examples

Report DTS Frame Information +FTC

Response	Possible command(s)
+FTC: <VR>, , <WD>, <LN>, <DF>, <EC>, <BF>, <ST>, <JP>	ATD ATA +FDT

	+FDR

Description

+FTC:<subparameter string> reports remote facsimile station capabilities and intentions. Originate, Answer, +FDT, +FDR command execution may generate these responses, if the corresponding frames are received, before the OK final result code.

Defined values

See +FCS

Report DIS Frame Information +FIS

Response	Possible command(s)
+FIS: <VR>, , <WD>, <LN>, <DF>, <EC>, <BF>, <ST>, <JP>	ATD ATA +FDT +FDR

Description

+FIS:<subparameter string> reports remote facsimile station capabilities and intentions. Originate, Answer, +FDT, +FDR command execution may generate these responses, if the corresponding frames are received, before the OK final result code.

Defined values

See +FCS

Remote Polling Indication +FPO

Response	Possible command(s)
+FPO	ATD ATA +FDT +FDR

Description

FPO indicates that the remote station has a document to poll and invites the DTE to poll it (see Table 2/T.30, bit 9). The FPO response is delivered between the FIS:<string>, and the OK final result code, if enabled. Originate, Answer, FDT or FDR command execution may generate this response. FSP0 inhibits the FPO response (8.5.1.8/T.32).

The DTE may respond to a FPO message with either a FDR command, to poll the remote station, or a FDT command, if it does not wish to poll.

Defined values

Informative examples

Report Remote ID +FTI

Response	Possible command(s)
+FTI:”<TSI ID string>”	ATD ATA +FDT +FDR

Description

The response reports the received remote transmit station ID string, if any. Originate, Answer, FDT or FDR command execution may generate these responses, if the corresponding frames are received.

The DCE shall report the characters in the ID string in reversed time order from the order received from the remote station. For example, if the following ID FIF character string is received (hexadecimal values):

<20><20><20><20><20><31><30><39><38><20><37><36><35><20><34><33><32><20><31><2B>

The result would be:

<CR><LF>FTI:"1 234 567 8901 "<CR><LF>

Defined values

Informative examples

ATA

©2004 BenQ Corporation. Confidential Property

+FCO
+FTI: "1 234 567 8901 "
OK

Report Remote ID +FPI

Response	Possible command(s)
+FPI:”<TSI ID string>”	ATD ATA +FDT +FDR

Description

The response reports the received remote polling station ID string, if any. Originate, Answer, FDT or FDR command execution may generate these responses, if the corresponding frames are received.

The DCE shall report the characters in the ID string in reversed time order from the order received from the remote station.

Defined values

Informative examples

Report Remote ID +FCI

Response	Possible command(s)
+FCI:”<TSI ID string>”	ATD ATA +FDT +FDR

Description

The response reports the received remote called station ID string, if any. Originate, Answer, FDT or FDR command execution may generate these responses, if the corresponding frames are received.

The DCE shall report the characters in the ID string in reversed time order

©2004 BenQ Corporation. Confidential Property

from the order received from the remote station. For example, if the following ID FIF character string is received (hexadecimal values):

Defined values

Informative examples

Report NSC Frames +FNC

Response	Possible command(s)
+FNC:"<NSF FIF string>"	ATD ATA +FDT +FDR

Description

The response reports any received Non-Standard Commands frames, one response per frame. Originate, Answer, FDT or FDR command execution may generate these responses, if the corresponding frames are received.

The NSF Facsimile Information Field (FIF) frame octets (beginning with the country code, but not including the FCS) are presented in hex notation, and separated by spaces. HDLC flags, and zero bits inserted for transparency are removed. Frame octets are reported in the order received. For each frame octet the LSB is the first bit sent or received. For example, the two octet bit string 0001101101000101 would be reported D8 A2.

The facsimile DCE reports the frame; it need not act on it. Specification of any other Non Standard behavior is beyond the scope of this document.

Defined values

Informative examples

Report NSF Frames +FNF

Response	Possible command(s)
+FNF:"<NSF FIF string>"	ATD ATA

©2004 BenQ Corporation. Confidential Property

	+FDT +FDR

Description

The response reports any received Non-Standard Facility frames, one response per frame. Originate, Answer, FDT or FDR command execution may generate these responses, if the corresponding frames are received.

The NSF Facsimile Information Field (FIF) frame octets (beginning with the country code, but not including the FCS) are presented in hex notation, and separated by spaces. HDLC flags, and zero bits inserted for transparency are removed. Frame octets are reported in the order received. For each frame octet the LSB is the first bit sent or received. For example, the two octet bit string 0001101101000101 would be reported D8 A2.

The facsimile DCE reports the frame; it need not act on it. Specification of any other Non Standard behavior is beyond the scope of this document.

Defined values

Informative examples

Report NSS Frames +FNS

Response	Possible command(s)
+FNS:”<NSF FIF string>”	ATD ATA +FDT +FDR

Description

The response reports any received Non-Standard Setup frames, one response per frame. Originate, Answer, FDT or FDR command execution may generate these responses, if the corresponding frames are received.

The NSF Facsimile Information Field (FIF) frame octets (beginning with the country code, but not including the FCS) are presented in hex notation, and separated by spaces. HDLC flags, and zero bits inserted for transparency are removed. Frame octets are reported in the order received. For each frame octet the LSB is the first bit sent or received. For example, the two octet bit

string 0001101101000101 would be reported D8 A2.

The facsimile DCE reports the frame; it need not act on it. Specification of any other Non Standard behavior is beyond the scope of this document.

Defined values

Informative examples

Report Password +FPW

Response	Possible command(s)
+FPW:”<PWD string>”	ATD ATA +FDT +FDR

Description

The response reports the received password string, if any. Originate, Answer, FDT or FDR command execution may generate these responses, if the corresponding frames are received.

If the corresponding subparameter in the FAP parameter is set, the DCE shall report the characters in the string in reversed time order from the order received from the remote station. For example, if the following hexadecimal Password string is received:

<39><38><37><36><35><34><33><32><31><30><39><38><37><36><35><34><33><32><31> <30>

The result would be:

<CR><LF>FPW:"0123456789012345678 9"<CR><LF>

Defined values

Informative examples

Report Destination Subaddress +FSA

Response	Possible command(s)
+FSA:”<SUB string>”	ATD

©2004 BenQ Corporation. Confidential Property

	ATA +FDT +FDR

Description

The response reports the received destination subaddress string, if any. Originate, Answer, FDT or FDR command execution may generate these responses, if the corresponding frames are received.

Defined values

Informative examples

Report Polling Address +FPA

Response	Possible command(s)
+FPA:”<SEP string>”	ATD ATA +FDT +FDR

Description

The response reports the received polling address string, if any. Originate, Answer, FDT or FDR command execution may generate these responses, if the corresponding frames are received.

Defined values

Informative examples

Report T.30 Phase C Page Reception +FPS

Response	Possible command(s)
+FPS: <ppr>, <lc>, <blc>, <cblc>, <lbc>	+FDR

Description

The FPS:<ppr> is generated by the DCE at the end of Phase C data reception, in execution of a FDR command.

The initial <ppr> is generated by the DCE; it depends on the DCE for T.4 or T.6 error checking capabilities, controlled by the FCQ parameter (8.5.2.3/T.32). Note that the <ppr> value may be changed by the DCE in response to a remote request for procedure interrupt (8.5.2.2/T.32).

The receiving DCE may count lines, bad lines, maximum consecutive bad lines, and octets lost due to DCE buffer overflow, and report them:

<lc>: line count;

<blc>: bad line count;

<cblc>: maximum consecutive bad line count; this is the number of lines in the largest group of consecutive bad lines;

<lbc>: lost octet count.

The line counts are qualified by the DCE's copy quality checking capabilities, controlled by the FCQ parameter (8.5.2.3/T.32). If the DCE is not configured to count lines, or if line counts are irrelevant (e.g. in Binary File Transfer mode, Recommendation T.434) the DCE shall set the line counts to 0.

A receiving DTE may inspect <ppr>, and write a modified value into the FPS parameter. The DCE shall hold the corresponding Post Page Response message until released by a subsequent FDR command from the DTE.

Defined values

<ppr>: Post Page Response

1: Page good (T.30 label: MCF; Result code: OK)

2: Page bad; retrain requested (T.30 label: RTN; Result code: ERROR)

3: Page good; retrain requested (T.30 label: RTP; Result code: OK)

4: Page good; remote request for procedure interrupt accepted (T.30 label: PIP; Result code: OK)

5: Page bad; retrain requested; remote request for procedure interrupt accepted (T.30 label: PIN; Result code: ERROR)

Informative examples

-Initial the HyperTerminal

-Initial the MS

-AT Command

AT+FDR

©2004 BenQ Corporation. Confidential Property

CONNECT
<page data>
<RTC pattern>
<DLE><ETX>
+FPS:1
OK

Post Page Messages Response +FET

Response	Possible command(s)
+FET:”<ppm>”	+FDR

Description

The FET:<post page message> response is generated by a receiving facsimile DCE on receipt of the post page message from the transmitting station, in execution of a FDR command. The <ppm> codes correspond to the T.30 post page messages.

Defined values

<ppm>: Post Page Message

0: Another page next, same document (T.30 mnemonic: MPS)

1: Another document next (T.30 mnemonic: EOM)

2: No more pages or documents (T.30 mnemonic: EOP)

3: Another page next, same document procedure interrupt requested (T.30 mnemonic: PRI-MPS)

4: Another document next (T.30 mnemonic: PRI-EOM)

5: No more pages or documents, procedure interrupt requested (T.30 mnemonic: PRI-EOP)

Informative examples

+FET: 2

Transition to Voice +FVO

Response	Possible command(s)
+FVO	

©2004 BenQ Corporation. Confidential Property

Description

FVO indicates that a procedure interruption has been negotiated, and the session has been suspended; the DCE remains off-hook. (The FCLASS parameter is unchanged.) This response is generated if either the local DTE initiated a procedure interrupt (8.3.3.8/T.32, 8.3.4.8/T.32), and the remote station agreed, or if the remote station requested a procedure interrupt, and the FIE parameter was set. If the remote station requests a procedure interrupt during document reception, the DCE issues a FVO response after the DTE issues the next FDR command with the FPS parameter set to accept the request.

The DTE should respond to a FVO message by suspending the session, and waiting for the operator or application process to determine if the session should be resumed or terminated.

Defined values

Informative examples

Call Termination Status +FHS

Response	Possible command(s)
+FHS:<hsc>	ATD ATA +FDT +FDR +FKS +FIP

Description

FHS indicates that the call has been terminated. The hangup cause is reported, and stored in the FHS parameter for later inspection. These values are described in Table 20.

FHS:<hsc> is a possible intermediate result code to any DTE action command described in 8.3/T.32. It is always followed by the OK final result code.

All <hsc> codes are two-digit hexadecimal values. The <hsc> values are organized according to the Phases of the facsimile transaction as defined by

©2004 BenQ Corporation. Confidential Property

Recommendation T.30.

©2004 BenQ Corporation. Confidential Property

Defined values

<hsc>: Hangup status code

Values	Hangup cause description
00-0F	Call placement and termination
00	Normal and proper end of connection
01	Ring detect without successful handshake
02	Call aborted, from +FKS or <CAN>
03	No loop current
04	Ringback detected, no answer (timeout)
05	Ringback detected, answer without CED
10-1F	Transmit Phase A and miscellaneous errors
10	Unspecified Phase A error
11	No answer (T.30 T1 timeout)
20-3F	Transmit Phase B hangup codes
20	Unspecified transmit Phase B error
21	Remote cannot receive or send
22	COMREC error in transmit Phase B
23	COMREC invalid command received
24	RSPREC error
25	DCS sent three times without response
26	DIS/DTC received 3 times; DCS not recognized
27	Failure to train at 2400 bit/s or +FMS value
28	RSPREC invalid response received
40-4F	Transmit Phase C hangup codes
40	Unspecified transmit Phase C error
41	Unspecified image format error
42	Image conversion error
43	DTE to DCE data underflow
44	Unrecognized transparent data command
45	Image error, line length wrong
46	Image error, page length wrong
47	Image error, wrong compression code
50-6F	Transmit Phase D hangup codes
50	Unspecified transmit Phase D error
51	RSPREC error
52	No response to MPS repeated 3 times
53	Invalid response to MPS

©2004 BenQ Corporation. Confidential Property

54	No response to EOP repeated 3 times
55	Invalid response to EOP
56	No response to EOM repeated 3 times
57	Invalid response to EOM
58	Unable to continue after PIN or PIP
70-8F	Receive Phase B hangup codes
70	Unspecified receive Phase B error
71	RSPREC error
72	COMREC error
73	T.30 T2 timeout, expected page not received
74	T.30 T1 timeout after EOM received
90-9F	Receive Phase C hangup codes
90	Unspecified receive Phase C error
91	Missing EOL after 5 seconds (3.2/T.4)
92	Bad CRC or frame (ECM mode)
93	DCE to DTE buffer overflow
A0-BF	Receive Phase D hangup codes
A0	Unspecified receive Phase D errors
A1	RSPREC invalid response received
A2	COMREC invalid response received
A3	Unable to continue after PIN or PIP
C0-DF	Reserved for future standardization
E0-FF	Reserved for manufacturer-specific use

Informative examples

+FHS: 00

Report Transmit HDLC Frames +FHT

Response	Possible command(s)
+FHT:”<transmitted HDLC frame octets>”	

Description

This reports the HDLC data that was sent by the DCE.

The DCE may be commanded to report the T.30 Phase B and Phase D HDLC control frames as they are sent and received. This service supports

session diagnostics and debugging DTE software. This service is enabled by the FBU parameter, described in 8.5.1.10. This facility does not apply to ECM Phase C data frames.

These messages are not generated in direct execution of DTE action commands; they are generated whenever the reported frame is sent or received, for each frame. Therefore, the DTE should not attempt to change serial port rate or parity with FBU set, and DTE commands shall not be echoed.

The data shall be reported with each T.30 command separated by <CR><LF>. The frame octets will be represented in hex notation and separated by spaces. The DCE shall delete HDLC Flags and FCS octets. Frame octets are reported in the order sent or received.

Defined values

Informative examples

Report Received HDLC Frames +FHR

Response	Possible command(s)
+FHR:”<transmitted HDLC frame octets>”	

Description

This reports the HDLC data that was received by the DCE.

The DCE may be commanded to report the T.30 Phase B and Phase D HDLC control frames as they are sent and received. This service supports session diagnostics and debugging DTE software. This service is enabled by the FBU parameter, described in 8.5.1.10. This facility does not apply to ECM Phase C data frames.

These messages are not generated in direct execution of DTE action commands; they are generated whenever the reported frame is sent or received, for each frame. Therefore, the DTE should not attempt to change serial port rate or parity with FBU set, and DTE commands shall not be echoed.

The data shall be reported with each T.30 command separated by <CR><LF>. The frame octets will be represented in hex notation and

©2004 BenQ Corporation. Confidential Property

separated by spaces. The DCE shall delete HDLC Flags and FCS octets. Frame octets are reported in the order sent or received.

Defined values

Informative examples

2.4.3 Service Commands

Service Class +FCLASS

Command	Possible response(s)
+FCLASS=<n>	OK ERROR
+FCLASS?	<n>
+FCLASS=?	(list of supported <n>s)

Description

Execution command puts the TA into a particular mode of operation (data, fax, voice etc.). This causes the TA to process information in a manner suitable for that type of information (rather than for other types of information).

Read command returns current Service Class settings of a Facsimile DCE. The response shall be a single value.

Test command returns available Service Classes of a Facsimile DCE. The response is a string of values, separated by commas, followed by a result code.

Defined values

<n>: Service class

0: data modem (ITU-T Rec. V.250)

2.0: fax class 2 (ITU-T Rec. T.32)

8: voice

Informative examples

-Initial the HyperTerminal

-Initial the MS

-AT Command

AT+FCLASS=?

0,2.0,8
OK

AT+FCLASS=2.0
OK
AT+FCLASS?
2.0
OK
AT+FCLASS=0
OK
AT+FCLASS?
0
OK
AT+FCLASS=8
OK
AT+FCLASS?
8
OK

DCE Capabilities Parameter +FCC

Command	Possible response(s)
+FCC=<VR>, , <WD>, <LN>, <DF>, <EC>, <BF>, <ST>, <JP>	OK ERROR
+FCC?	+FCC: <VR>, , <WD>, <LN>, <DF>, <EC>, <BF>, <ST>, <JP>
+FCC=?	+FCC: (list of supported<VR>, , <WD>, <LN>, <DF>, <EC>, <BF>, <ST>, <JP>)

Description

+FCC allows the DTE to sense and constrain the capabilities of the facsimile DCE, from the choices defined in Table 2/T.30. When +FCC is modified by the DTE, the DCE shall copy +FCC into +FIS.

Defined values

See +FCS

©2004 BenQ Corporation. Confidential Property

Informative examples

-Initial the HyperTerminal

-Initial the MS

-AT Command

AT+FCC=1,3,0,0,0,0,0,0,0

OK

Current Session Parameter +FIS

Command	Possible response(s)
+FIS=<VR>, , <WD>, <LN>, <DF>, <EC>, <BF>, <ST>, <JP>	OK ERROR
+FIS?	+FIS: <VR>, , <WD>, <LN>, <DF>, <EC>, <BF>, <ST>, <JP>
+FIS=?	+FIS: (list of supported<VR>, , <WD>, <LN>, <DF>, <EC>, <BF>, <ST>, <JP>)

Description

+FIS allows the DTE to sense and constrain the capabilities of current session. The DCE uses +FIS to generate DIS or DTC messages directly, and uses +FIS and received DIS messages to generate DCS messages. The DCE shall set the FIS parameter from the FCC parameter on DCE initialization, upon FIP command execution, when FCC is written, and at the end of a session.

Defined values

See +FCS

Informative examples

-Initial the HyperTerminal

-Initial the MS

-AT Command

AT+FIS=1,1,0,0,0,0,0,0

OK

©2004 BenQ Corporation. Confidential Property

Current Session Result +FCS

Command	Possible response(s)
+FCS?	+FCS: <VR>, , <WD>, <LN>, <DF>, <EC>, <BF>, <ST>, <JP>

Description

The +FCS parameter is loaded with the negotiated T.30 parameters for the current session. A transmitting DCE generates DCS; a receiving DCE gets DCS from the remote station. The DTE may only read this parameter.

The DCE shall set the +FCS parameter to the default values on DCE initialization, on +FIP command execution, and at the end of a session.

The contents of FCS are spontaneously reported during execution of FDR or FDT commands, by the +FCS:VR,BR,WD,LN,DF,EC,BF,ST,JP response, using the same compound parameter format.

Defined values

See +FCS

Informative examples

Local Facsimile Station ID String +FLI

Command	Possible response(s)
+FLI=”local ID string”	OK ERROR
+FLI?	+FLI: ”local ID string”
+FLI=?	+FLI: (list of supported characters)

Description

The DCE shall send the corresponding ID frame if FLI is not a null string. +FLI is used for CSI or TSI. Table 3/T.30 includes digits 0-9, "+" and space. The DCE shall transmit ID string characters to the remote station in reversed time order from the order in the command line. For example, if the command

©2004 BenQ Corporation. Confidential Property

line: AT+FLI="+1 234 567 8901"<CR> is issued, the DCE would send a CSI or TSI frame with FIF (hexadecimal) consisting of: <20><20><20><20><20><31><30><39><38><20><37><36><35><20><34><33><32><20><31><2B>

The +FLI=? test command reports the range of character values supported. For example, if the DCE supports use of Table 3/T.30 only, the response to a +FLI=? command is "(20,2B,30-39)" (hexadecimal values); if the DCE supports printable T.50, the response is: “20-7E”.

If less than 20 characters are specified in a non-null string, the DCE shall append space characters (2/0). If the specified string is more than 20 characters in length, an ERROR result code is generated.

Defined values

Informative examples

-Initial the HyperTerminal

-Initial the MS

-AT Command

AT+FLI=”Local ID "

OK

Local polling ID String +FPI

Command	Possible response(s)
+FPI=”local polling ID string”	OK ERROR
+FPI?	+FPI: ”local polling ID string”
+FPI=?	+FPI: (list of supported characters)

Description

The DCE shall send the corresponding ID frame if FPI is not a null string. +FPI is used for CIG. Table 3/T.30 includes digits 0-9, "+" and space. The DCE shall transmit ID string characters to the remote station in reversed time order from the order in the command line. For example, if the command line: AT+FPI="+1 234 567 8901"<CR> is issued, the DCE would send a CIG frame with FIF (hexadecimal) consisting of: <20><20><20><20><20><31><30><39><38><20><37><36><35><20><34><

33><32><20><31><2B>

The +FPI=? test command reports the range of character values supported. For example, if the DCE supports use of Table 3/T.30 only, the response to a +FPI=? command is "(20,2B,30-39)" (hexadecimal values); if the DCE supports printable T.50, the response is: “20-7E”.

If less than 20 characters are specified in a non-null string, the DCE shall append space characters (2/0). If the specified string is more than 20 characters in length, an ERROR result code is generated.

Defined values

Informative examples

Non-Standard Frame FIF Octet String +FNS

Command	Possible response(s)
+FNS=”<string of hexadecimal coded octets>”	OK ERROR
+FNS?	+FNS: ”<string of hexadecimal coded octets>”
+FNS=?	+FNS: (number of octets that the parameter can hold)

Description

The DCE shall send the corresponding non-standard facilities frame if FNS is not a null string. The type of frame is determined by the type of negotiation frame to be sent NSF sent with DIS; NSS sent with DCS; NSC sent with DTC.

The DCE only delivers the data; the DTE must determine the content. The first octet must be the country code (see Recommendation T.35). This parameter may require 180 hexadecimal characters to specify. The +FNS= "<hex string>" may be repeated with new data; each use appends data to the data entered previously. The +FNS"" command resets this parameter to a null string.

The <hexadecimal coded octet string> shall consist of pairs of hexadecimal numbers (T.50 3/0-3/9, 4/1-4/6). Spaces between octets shall be ignored by the DCE. The DCE shall send octets in the order loaded. Each

©2004 BenQ Corporation. Confidential Property

octet shall be sent LSB first; the string "D8A2" would result in the following bit pattern: 0001101101000101. (Note – This is the same format used in Non-Standard frame reports, see 8.4.2.4/T.32.)

Defined values

Informative examples

Indicate Document to Poll +FLP

Command	Possible response(s)
+FLP=<value>	OK ERROR
+FLP?	+FLP: <value>
+FLP=?	+FLP: (list of supported <value>s)

Description

The command indicates document available for polling.

Defined values

<value>

0: Indicates that the DTE has no document to poll. The DIS bit 9 will be cleared. Any received DTC frames will be result in an orderly disconnection, with hangup status code +FHS:23.

1: Indicates that the DTE has a document ready for polling. The DIS bit 9 will be set, to report this to the remote station. Any received DTC frames will be accepted. The DCE shall reset this parameter to 0 after a polled document is sent.

Informative examples

Request to Poll +FSP

Command	Possible response(s)
+FSP=<value>	OK ERROR
+FSP?	+FSP: <value>

©2004 BenQ Corporation. Confidential Property

+FSP=?	+FSP: (list of supported <value>s)

Description

The command indicates request for polling.

Defined values

<value>

0: Indicates that the DTE does not want to poll. Bit 9 in a received DIS frame will be ignored.

1: Indicates that the DTE can receive a polled document. Bit 9 in received DIS frames will be reported by the +FPO response (8.4.2.2). The DCE shall reset this parameter to 0 after a polled document is received.

Informative examples

Capability to Receive +FCR

Command	Possible response(s)
+FCR=<value>	OK ERROR
+FCR?	+FCR: <value>
+FCR=?	+FCR: (list of supported <value>s)

Description

The command indicates capability to receive.

Defined values

<value>

0: Indicates the DCE will not receive message data; also, the DCE will not be able to poll a remote device. This clears bit 10 in the DIS or DTC frame. This can be used when the DTE has insufficient storage, or if the DCE does not have a Phase C demodulator. The DCE can send and can be polled for a document.

1: Indicates the DCE can receive message data. Bit 10 in the DIS or DTC frame will be set.

Informative examples

-Initial the HyperTerminal

-Initial the MS

-AT Command

AT+FCR=1

OK

HDLC Frame Reporting +FBU

Command	Possible response(s)
+FBU=<value>	OK ERROR
+FBU?	+FBU: <value>
+FBU=?	+FBU: (list of supported <value>s)

Description

The command enables/disables HDLC frame reporting.

Defined values

<value>

0: Disables HDLC frame reporting.

1: Enables the DCE to report the contents of Phase B and Phase D HDLC frames to the DTE, as they are sent and received, in addition to other responses. These will be reported using the +FHT: and +FHR: responses, described in 8.6/T.32.

Informative examples

Negotiation Reporting +FNR

Command	Possible response(s)
+FNR=<rpr>, <tpr>, <idr>, <nsr>	OK ERROR
+FNR?	+FNR: <rpr>, <tpr>, <idr>, <nsr>
+FNR=?	+FNR: (list of supported <rpr>, <tpr>, <idr>, <nsr>s)

©2004 BenQ Corporation. Confidential Property

Description

The command is a compound parameter, used to control the reporting of messages generated during T.30 Phase B negotiations. There are four switches, for four types of reports. See defined values for details.

Defined values

Switch setting	Description
rpr=0	Receiver parameters are not reported +FIS: and +FTC: reports are suppressed
rpr=1	Receiver parameters are reported +FIS: and +FTC: reports are generated
tpr=0	Transmitter parameters are not reported +FCS: reports are suppressed (+FCS parameter is still loaded)
tpr=1	Transmitter parameters are reported +FCS: reports are generated
idr=0	ID strings are not reported. +FTI:, +FCI: and +FPI: reports are suppressed
idr=1	ID strings are reported. +FTI:, +FCI: and +FPI: reports are generated
nsr=0	Non-standard frames are not reported. +FNF:, +FNS: and +FNC: reports are suppressed
nsr=1	Non-standard frames are reported. +FNF:, +FNS: and +FNC: reports are generated

Informative examples

-Initial the HyperTerminal

-Initial the MS

-AT Command

AT+FNR=1,1,1,0

OK

Address and Polling Capabilities +FAP

Command	Possible response(s)
+FAP=<sub>, <sep>,	OK

©2004 BenQ Corporation. Confidential Property

<pwd>	ERROR
+FAP?	+FAP: <sub>, <sep>, <pwd>
+FAP=?	+FAP: (list of supported <sub>, <sep>, <pwd>s)

Description

The command indicates inbound subaddressing, selective polling and password capabilities to remote station, via the corresponding bits in the DIS or DTC frames.

Defined values

<sub>, <sep>, <pwd>:

0: disable

1: enable

Informative examples

Address and Polling Frames/Subaddress +FSA

Command	Possible response(s)
+FSA=”<destination subaddress string>”	OK ERROR
+FSA?	+FSA: ”<destination subaddress string>”
+FSA=?	+FSA: (list of supported characters)

Description

The DCE shall send the numeric string contained in +FSA at the times specified in Recommendation T.30, if the corresponding parameter is not a null string. Recommendation T.30 defines these frames for values of digits 0-9, space, * and # characters only.

The DCE shall transmit digit string characters to the remote station in reversed time order from the order in the command line. For example, if the command line AT+FSA="1 012 3456789**01#" is issued, the DCE would add two space characters, and send a SUB frame with FIF consisting of the following octets (expressed as hexadecimal digits):

<23><31><30><2A><2A><39><38><37><36><35><34><33><20><32><31><30><20><31><20><20>

©2004 BenQ Corporation. Confidential Property

If less than 20 characters are specified in a non-null string, the DCE shall append space characters (2/0). If the specified string is more than 20 characters in length, an ERROR result code is generated.

Defined values

Informative examples

Address and Polling Frames/Polling Address +FPA

Command	Possible response(s)
+FPA=”<selective polling address string>”	OK ERROR
+FPA?	+FPA: ” <selective polling address string>”
+FPA=?	+FPA: (list of supported characters)

Description

The DCE shall send the numeric string contained in +FPA at the times specified in Recommendation T.30, if the corresponding parameter is not a null string. Recommendation T.30 defines these frames for values of digits 0-9, space, * and # characters only.

The DCE shall transmit digit string characters to the remote station in reversed time order from the order in the command line.

If less than 20 characters are specified in a non-null string, the DCE shall append space characters (2/0). If the specified string is more than 20 characters in length, an ERROR result code is generated.

Defined values

Informative examples

Address and Polling Frames/Password +FPW

Command	Possible response(s)

©2004 BenQ Corporation. Confidential Property

+FPW=”<password string>”	OK ERROR
+FPW?	+FPA: ” <password string>”
+FPW=?	+FPA: (list of supported characters)

Description

The DCE shall send the numeric string contained in +FPW at the times specified in Recommendation T.30, if the corresponding parameter is not a null string. The +FPW parameter is used for the PWD frame sent with either DTC or with DCS. Recommendation T.30 defines these frames for values of digits 0-9, space, * and # characters only.

The DCE shall transmit digit string characters to the remote station in reversed time order from the order in the command line.

If less than 20 characters are specified in a non-null string, the DCE shall append space characters (2/0). If the specified string is more than 20 characters in length, an ERROR result code is generated.

Defined values

Informative examples

Procedure Interrupt Enable +FIE

Command	Possible response(s)
+FIE=<value>	OK ERROR
+FIE?	+FIE: <value>
+FIE=?	+FIE: (list of supported <value>s)

Description

The command decides the operation upon receipt of Procedure Interrupt Requests from remote station.

For transmission (+FDT), Procedure Interrupt Requests from the remote station are not reported directly; only the +FVO response is reported.

For reception (+FDR), Procedure Interrupt Requests from the remote station are reported in the +FET: response. The value stored in the +FPS parameter will be adjusted to values 4 or 5. If the DTE issues a subsequent +FDR command with the +FPS value intact, the DCE will complete the negotiation and issue a +FVO response.

Defined values

<value>

0: Procedure Interrupt Requests from the remote station are ignored, and not reported to the DTE. For the +FET: response (8.4.4.1), PRI-Q reports will be replaced by non-PRI equivalents.

1: Procedure Interrupt Requests from the remote station are accepted, negotiated and reported using the +FVO response (8.4.4.2).

Informative examples

Page Status +FPS

Command	Possible response(s)
+FPS=<ppr>	OK ERROR
+FPS?	+FPS: <ppr>
+FPS=?	+FPS: (list of supported <ppr>s)

Description

The +FPS parameter contains a value representing the post page response, including copy quality and related end-of-page status. These values correspond to post page response messages defined in Recommendation T.30. The receiving DCE sets this parameter after it receives a page of Phase C data. The transmitting DCE sets this parameter with the status reported by the receiving station. The DTE may inspect or modify this parameter.

Valid <ppr> values are defined below. These values are also reported by the +FPS:<ppr> response to the +FDR command (8.4.3/T.32).

The DCE may set this parameter to values 1, 2 or 3 based on its own copy

©2004 BenQ Corporation. Confidential Property

quality checking or access to received signal quality. The DCE shall set this parameter to a value of 1 if copy quality checking is disabled (+FCQ=0, see 8.5.2.3/T.32).

Copy quality checking is the responsibility of the DCE. However, a receiving DTE may do its own Copy Quality checking.

The DTE may request a Procedure Interrupt from the remote station using this parameter. To do so, the DTE shall modify the value reported by the DCE before it issues the next +FDR command, which in turn instructs the DCE to send the resulting post page response to the remote facsimile station.

Defined values

<ppr>: Post Page Response

1: Page good (T.30 label: MCF; Result code: OK)

2: Page bad; retrain requested (T.30 label: RTN; Result code: ERROR)

3: Page good; retrain requested (T.30 label: RTP; Result code: OK)

4: Page good; remote request for procedure interrupt accepted (T.30 label: PIP; Result code: OK)

5: Page bad; retrain requested; remote request for procedure interrupt accepted (T.30 label: PIN; Result code: ERROR)

Informative examples

Copy Quality Checking +FCQ

Command	Possible response(s)
+FCQ=<rq>,<tq>	OK ERROR
+FCQ?	+FCQ: <rq>, <tq>
+FCQ=?	+FCQ: (list of supported <rq>, <tq>s)

Description

The +FCQ compound parameter controls copy quality checking and correction by a facsimile DCE. The <rq> subparameter controls copy quality checking and correction of data received from the remote station and delivered to the local DTE; the <tq> subparameter controls copy quality checking and

correction of image data received from the local DTE and sent to the remote facsimile station.

Receive copy quality checking is the responsibility of the DCE, for any data type supported. However, the DTE may turn off copy quality checking by setting +FCQ=0,0, or by setting +FND=1 (8.5.2.10/T.32).

Copy quality checking consists of determining if the incoming image data conforms to the negotiated standard format, e.g. Recommendation T.4 or T.6. Copy quality correction consists of detecting errors and altering the data in some way to guarantee that only valid data (according to negotiated parameters) is delivered. See Table 24/T.32.

The methods used for copy quality checking or for correction are not a subject of T.32. The DCE may use the associated T.30 control parameters to condition its Copy Quality Checking behaviour (8.5.2.4/T.32). Common procedures for Copy Quality correction include deletion of bad lines or replacement of bad lines by previous good lines.

The DCE shall report on Received Copy Quality to the DTE in the page status report, +FPS:<ppr>,<lc>,<blc>,<cblc>,<lbc> (8.4.3/T.32), and record it in the +FPS parameter (8.5.2.2/T.32).

Defined values

<rq>: Copy Quality Checking of data received

0: DCE receive copy quality checking is disabled. The DCE will generate copy quality OK (MCF) responses to complete pages and set +FPS=1

<tq>: Copy Quality Checking of data sent to remote station

0: DCE transmit copy quality checking is disabled. The DTE is responsible for T.4 or T.6 compliance.

Informative examples

Receive quality Thresholds +FRQ

Command	Possible response(s)
+FRQ=<pgl>,<cbl>	OK ERROR
+FRQ?	+FRQ: <pgl>,<cbl>
+FRQ=?	+FRQ: (list of supported <pgl>,<cbl>s)

©2004 BenQ Corporation. Confidential Property

Description

The DCE may use this compound parameter to make the "Copy Quality OK" decision in the T.30 flow chart (Figure A.7/T.30). If used, the DCE shall judge Copy Quality unacceptable if either the percentage of good lines is too low or too many consecutive lines contain errors. Bad line counts are reported in the +FPS:<blc> response, described in 8.4.3. A value of 0 disables either subparameter for use in copy quality checking.

Defined values

<pgl>: percentage of good lines

0: unsupported

<cbl>: consucutive bad lines

0: unsupported

Informative examples

Adaptive Answer +FAA

Command	Possible response(s)
+FAA=<value>	OK ERROR
+FAA?	+FAA: <value>
+FAA=?	+FAA: (list of supported <value>s)

Description

The command indicates the capability of switching of service class.

Defined values

<value>:

0: unsupported

Informative examples

DTE Phase C Response Timeout +FCT

Command	Possible response(s)
+FCT=<value>	OK ERROR
+FCT?	+FCT: <value>
+FCT=?	+FCT: (list of supported <value>s)

Description

The command determines how long the DCE will wait for a command after having transmitted all available Phase C data.

For transmission (+FDT), when this timeout is reached, the DCE shall properly terminate any Phase C data transfer in progress, then execute an implied +FKS orderly abort command.

For reception (+FDR), when this timeout is reached, the DCE shall send the T.30 DCN response to the remote station and execute an implied orderly abort command.

Defined values

<value>:

1Eh: 30 seconds

Informative examples

Call Termination Status +FHS

Command	Possible response(s)
+FHS?	+FHS: <hsc>

Description

This read only parameter indicates the cause of a hangup. Table 19 shows the valid values for this parameter as well as the meaning of each value. +FHS is set by the DCE at the conclusion of a fax session. The DCE shall reset this parameter to 0 at the beginning of Phase A.

Defined values

See +FHS:

Informative examples

ECM Retry Count +FRY

Command	Possible response(s)
+FRY=<value>	OK ERROR
+FRY?	+FRY: <value>
+FRY=?	+FRY: (list of supported <value>s)

Description

In Error Correcting Mode the transmitting DCE will try to send a partial page four times. These four attempts are called an "attempt block". If the transmitting DCE is not successful sending an attempt block at a particular signaling rate, it must decide if it should: i) retry the attempt block at the current signaling rate; ii) retry the attempt block at a lower signaling rate, or iii) discontinue trying to send the partial page.

i) The transmitting DCE may continue to retry the attempt block at a particular signaling rate up to +FRY times. If the +FRY parameter is zero, the partial page cannot be resent at the current signaling rate.

ii) The transmitting DCE may select a lower signaling rate subject to the +FMS parameter, and send the partial page at the new lower signaling rate.

iii) The transmitting DCE can only discontinue sending the partial page once +FRY attempt block retries have been made at the lowest permissible signaling rate, as defined by the +FMS command. If the DCE fails to deliver the partial page, it shall send a DCN to the remote device, issue +FHS to the DTE, and disconnect in accordance with Recommendation T.30. If ECM is not required for a particular facsimile transfer, the DCE may alternatively send an EOR to the receiving station and return an ERROR result code for the +FDT command.

This allows the DCE to retry up to +FRY attempt blocks at each signaling rate and ensures +FRY attempt block retries at the lowest signaling rate specified in the +FMS parameter.

Defined values

<value>:

0: Partial page cannot be resent at current signaling rate.

©2004 BenQ Corporation. Confidential Property

Informative examples

Minimum Phase C Speed +FMS

Command	Possible response(s)
+FMS=<value>	OK ERROR
+FMS?	+FMS: <value>
+FMS=?	+FMS: (list of supported <value>s)

Description

This optional parameter limits the lowest negotiable speed for a session. This parameter is useful for limiting the cost of a transmission, by requiring a minimum transmission speed. If the facsimile DCE cannot negotiate to a minimum speed, it shall perform an orderly disconnect.

Defined values

<value>: BR subparameter codes

The units are the same as those defined for the BR Bit Rate subparameter, defined in 8.5.1.4/T.32. See +FCS:

Informative examples

Inactivity Timeout +FIT

Command	Possible response(s)
+FIT=<time>,<action>	OK ERROR
+FIT?	+FIT: <time>,<action>
+FIT=?	+FIT: (list of supported <time>,<action>s)

Description

A service Class 2 facsimile DCE shall provide an inactivity timer that allows the DCE to break away from an unsuccessful connection attempt at any stage of a facsimile transfer. The inactivity timer only works while the DCE is off-hook.

©2004 BenQ Corporation. Confidential Property

The <time> parameter indicates the inactivity timeout in seconds. The required timeout is 1 to 255 seconds. The value of 0 indicates that timeout is disabled. Any values greater than 255 are optional values for the DCE manufacturer. The <action> parameter has two meanings.

The inactivity timer starts when the DCE has taken some action that requires DTE response. If the DTE does respond, the DCE shall reset the inactivity timer. Tables 25 and 26 define these sets of events.

Defined values

<time>: inactivity timeout

<action>:

0: Upon timeout, the DCE shall go on-hook, executing an implied ATH command; then reset to +FCLASS=0 if +FCLASS=0 is supported by the DCE

1: Upon timeout, the DCE shall only go on-hook. This feature is used to detect possible system failure, when either no line or DTE activity has occurred for a minimum amount of time

Informative examples

Minimum Phase C Speed +FMS

Command	Possible response(s)
+FMS=<value>	OK ERROR
+FMS?	+FMS: <value>
+FMS=?	+FMS: (list of supported <value>s)

Description

This optional parameter limits the lowest negotiable speed for a session. This parameter is useful for limiting the cost of a transmission, by requiring a minimum transmission speed. If the facsimile DCE cannot negotiate to a minimum speed, it shall perform an orderly disconnect.

Defined values

<value>: BR subparameter codes

©2004 BenQ Corporation. Confidential Property

The units are the same as those defined for the BR Bit Rate subparameter, defined in 8.5.1.4/T.32. See +FCS

Informative examples

Report Buffer Size +FBS

Command	Possible response(s)
+FBS?	+FBS: <tbs>, <rbs>

Description

This parameter allows the DCE to report the size of the DCE's data buffers. The values shall be in hexadecimal and represent the buffer size in octets.

The DCE shall provide sufficient receive buffer to accommodate 3 seconds of flow-control-off at the maximum receive speed; at 9600 bit/s, this is E10h octets (3600 decimal).

Defined values

<tbs>: transmit buffer size

<rbs>: receive buffer size

Informative examples

Packet Protocol Control +FPP

Command	Possible response(s)
+FPP=<value>	OK ERROR
+FPP?	+FPP: <value>
+FPP=?	+FPP: (list of supported <value>s)

Description

This command controls packet protocol to be used in DCE-DTE.

Defined values

©2004 BenQ Corporation. Confidential Property

<value>:

0: Disable the DCE-to-DTE packet protocol.

Informative examples

Data Bit Order +FBO

Command	Possible response(s)
+FBO=<value>	OK ERROR
+FBO?	+FBO: <value>
+FBO=?	+FBO: (list of supported <value>s)

Description

This parameter controls the mapping between PSTN facsimile data and the DTE-DCE link. There are two choices:

· Direct – The first bit transferred of each octet on the DTE-DCE link is the first bit transferred on the GSTN data carrier.

· Reversed – The last bit transferred of each octet on the DTE-DCE link is the first bit transferred on the GSTN data carrier.

There are two data types to control:

· Phase C data – T.4 or T.6 encoded data, or any other type of data (e.g. T.434 BFT), transferred during execution of +FDT or +FDR commands.

· Phase B/D data – T.30 Phase B and Phase D control messages, reported to the DTE in +FHT: and +FHR: reports only (8.6), enabled by the +FBU parameter (8.5.1.10/T.32).

Defined values

<value>:

0: Selects direct bit order for both Phase C data and for Phase B/D data

1: Selects reversed bit order for Phase C data and selects direct bit order for Phase B/D data

2: Selects direct bit order for Phase C data and selects reversed bit order for Phase B/D data

3: Selects reversed bit order for both Phase C data and for Phase B/D data

Informative examples

-Initial the HyperTerminal

-Initial the MS

-AT Command

AT+FBO=0

OK

Phase C Received EOL Alignment +FEA

Command	Possible response(s)
+FEA=<value>	OK ERROR
+FEA?	+FEA: <value>
+FEA=?	+FEA: (list of supported <value>s)

Description

This parameter enables optional octet-alignment of EOL markers in received T.4 data streams. It does not apply to T.6 data, or to any other form of data (e.g. T.434 BFT).

Defined values

<value>:

0: Determines that T.4 EOL patterns are bit aligned (as received).

Informative examples

Image Data Format Conversion +FFC

Command	Possible response(s)
+FFC=<vrc>, <dfc>, <lnc>, <wdc>	OK ERROR
+FFC?	+FFC: <vrc>, <dfc>, <lnc>, <wdc>
+FFC=?	+FFC: (list of supported <vrc>, <dfc>, <lnc>, <wdc>s)

Description

This compound parameter determines the DCE response to mismatches between the Phase C data delivered after the +FDT command and the data format parameters negotiated for the facsimile session. [See +FCS: response (8.4.2.1) and +FCS parameter (8.5.1.3).]

For mismatch checking, the DCE depends on the DTE to indicate the data format with embedded <DLE><format> character pairs (see Table 9). If these format indicators are not provided, the DCE shall assume that the format is as negotiated for that session.

For each subparameter, value 0 determines that mismatch checking is disabled, and all format codes of this type are ignored. Value 1 determines that mismatch checking is enabled, with session termination if the format codes do not match the negotiated format reported in +FCS: responses. Other values enable degrees of format conversion. Unspecified values are reserved.

Defined values

<vrc>:

0: Vertical resolution format codes ignored

<dfc>:

0: Data format format codes ignored

<lnc>:

0: Page length format codes ignored

<wdc>:

0: Page width format codes ignored

Informative examples

Modem ID +FMI

Command	Possible response(s)
+FMI?	<manufacturer> +CME ERROR: <err>

Description

Read handset or model's manufacturer's ID. Same as +GMI.

Defined values

<manufacturer> : total number of characters shall not exceed 2048.

Informative examples

Model ID +FMM

Command	Possible response(s)
+FMM?	<model> +CME ERROR: <err>

Description

Read model information which determined by ME manufacturer.

Defined values

<model id>: string type

Informative examples

Revision ID +FMR

Command	Possible response(s)
+FMR?	<revision> +CME ERROR: <err>

Description

Read revision of ME. It may include software and hardware revision.

Defined values

<revision >: HWv:a.bc , SWv:d.ef

a,b,c,d,e,f are decimal digits.

Informative examples

-Initial the HyperTerminal

-Initial the MS

-AT Command

AT+FMR<CR>

HWv:1.0 ,SWv:0.04

OK

©2004 BenQ Corporation. Confidential Property

Flow Control +FLO

Command	Possible response(s)
+FLO=<value>	OK ERROR
+FLO?	+FLO: <value>
+FLO=?	+FLO: (list of supported <value>s)

Description

This commands controls the mode of DTE-DCE flow control.

Defined values

<value>: DTE-DCE flow control

0: Turn off flow control

1: DC1/DC3 flow control (software flow control)

2: Circuit 106/133 flow control (hardware flow control)

Informative examples

-Initial the HyperTerminal

-Initial the MS

-AT Command

AT+FLO=1<CR>

OK

2.4.4 Examples (WinFax Pro)

DCE Initialization

ATE0V1

OK

AT&F&C1&D2S7=55

OK

AT+FCLASS=2.0;+FLO=1;

OK

ATE0V1&D2S0=0S8=2

OK

AT+FNR=1,1,1,0;+FCR=1;+FBO=1;+FCC=1,3,0,0,0,0,0,0

OK
AT+FCLASS=0
OK
ATE0V1S0=0
OK

Send One Page

ATE0V1
OK
AT&F&C1&D2S7=55
OK
AT+FCLASS=2.0;+FLO=1;
OK
ATE0V1&D2S0=0S8=2
OK
AT+FNR=1,1,1,0;+FCR=1;+FBO=1;+FCC=1,3,0,0,0,0,0,0
OK
ATE0V1M1L1
OK
AT+FLI="Local ID "
OK
AT+FIS=1,3,0,0,0,0,0,0
OK
AT+FNR=1,1,1,0;
OK
AT+X4DT012345678
OK
+FCO
+FIS:1,3,0,2,0,0,0,0,0
AT+FDT
OK
+FCS:1,3,0,0,0,0,0,0,0
CONNECT
<page data>
+FHS:00
OK
AT+FPS?
+FPS:1

AT
OK
ATH0
OK

Receive One Page

ATE0V1M1L1
OK
AT+FCLASS=2.0
OK
AT+FLI=”Local ID ”
OK
AT+FNR=1,1,1,0;+FCR=1;+FBO=0;+FCC=1,3,0,0,0,0,0,0
OK
ATA
+FCO
+FTI:”Remote ID”
+FCS:0,3,0,0,0,0,0,0,0
OK
AT+FDR
CONNECT
+FPS:1,28,0,0,0
+FET:2
OK
AT+FDR
+FHS:00
OK
AT
OK
ATH0
OK

2.5 GPRS related commands

2.5.1 Define PDP Context +CGDCONT

Table: +CGDCONT parameter command syntax

Command	Possible response(s)

+CGDCONT=[<cid> [,<PDP_type> [,<APN> [,<PDP_addr> [,<d_comp> [,<h_comp> [,<pd1> [,…[,pdN]]]]]]]]]	OK ERROR
+CGDCONT?	+CGDCONT: <cid>, <PDP_type>, <APN>,<PDP_addr>, <data_comp>, <head_comp>[,<pd1>[,…[,pdN]]] [<CR><LF>+CGDCONT: <cid>, <PDP_type>, <APN>,<PDP_addr>, <data_comp>, <head_comp>[,<pd1>[,…[,pdN]]] [...]]
+CGDCONT=?	+CGDCONT: (range of supported <cid>s), <PDP_type>,,,(list of supported <d_comp>s),(list of supported <h_comp>s)[,(list of supported <pd1>s)[,…[,(list of supported <pdN>s)]]] [<CR><LF>+CGDCONT: (range of supported <cid>s), <PDP_type>,,,(list of supported <d_comp>s),(list of supported <h_comp>s)[,(list of supported <pd1>s)[,…[,(list of supported <pdN>s)]]] [...]]

Description

The set command specifies PDP context parameter values for a PDP context identified by the (local) context identification parameter, <cid>. The number of PDP contexts that may be in a defined state at the same time is given by the range returned by the test command.

A special form of the set command, +CGDCONT= <cid> causes the values for context number <cid> to become undefined.

The read command returns the current settings for each defined context.

The test command returns values supported as a compound value. If the MT supports several PDP types, <PDP_type>, the parameter value ranges for each <PDP_type> are returned on a separate line.

Defined values

<cid>: (PDP Context Identifier) a numeric parameter which specifies a particular PDP context definition. The parameter is local to the TE-MT interface and is used in other PDP context-related commands. The range of permitted values (minimum value = 1) is returned by the test form of the command.

<PDP_type>: (Packet Data Protocol type) a string parameter which specifies the type of packet data protocol

IP	Internet Protocol (IETF STD 5)
IPV6	Internet Protocol, version 6 (IETF RFC 2460)
PPP	Point to Point Protocol (IETF STD 51)

<APN>: (Access Point Name) a string parameter which is a logical name that is used to select the GGSN or the external packet data network.
If the value is null or omitted, then the subscription value will be requested.

<PDP_address>: a string parameter that identifies the MT in the address space applicable to the PDP.
If the value is null or omitted, then a value may be provided by the TE during the PDP startup procedure or, failing that, a dynamic address will be requested.

The read form of the command will continue to return the null string even if an address has been allocated during the PDP startup procedure. The allocated address may be read using the +CGPADDR command.
<d_comp>: a numeric parameter that controls PDP data compression
0 - off (default if value is omitted)
1 - on
Other values are reserved.

<h_comp>: a numeric parameter that controls PDP header compression
0 - off (default if value is omitted)
1 - on
Other values are reserved.

NOTE: At present only one data compression algorithm (V.42bis) is provided in SNDCP. If and when other algorithms become available, a command will be provided to select one or more of these.

<pd1>, … <pdN>: zero to N string parameters whose meanings are specific to the <PDP_type>

For PDP type OSP:IHOSS the following parameters are defined:
<pd1> = <host> the fully formed domain name extended hostname of the Internet host
<pd2> = <port > the TCP or UDP port on the Internet host
<pd3> = <protocol> the protocol to be used over IP on the Internet - "TCP" or "UDP

Informative examples

-Initial the HyperTerminal
-Initial the MS
-AT Command

1. Set APN for TWNGSM

AT_CGDCONT=1,”IP”,”internet

OK

2. Query +CGDCONT

AT+CGDCONT?

+CGDCONT: 1, “IP”, “internet”, “”,0,0

2.5.2 Quality of Service Profile (Request) +CGQREQ

Table: +CGQREQ parameter command syntax

Command	Possible Response(s)
+CGQREQ=[<cid> [,<precedence > [,<delay> [,<reliability.> [,<peak> [,<mean>]]]]]]	OK ERROR
+CGQREQ?	+CGQREQ: <cid>, <precedence >, <delay>, <reliability>, <peak>, <mean> [<CR><LF>+CGQREQ: <cid>, <precedence >, <delay>, <reliability.>, <peak>, <mean>

	<mean> […]]
+CGQREQ=?	+CGQREQ: <PDP_type>, (list of supported <precedence>s), (list of supported <delay>s), (list of supported <reliability>s) , (list of supported <peak>s), (list of supported <mean>s) [<CR><LF>+CGQREQ:<PDP_type> ,(list of supported <precedence>s), (list of supported <delay>s), (list of supported <reliability>s) , (list of supported <peak>s), (list of supported <mean>s) […]]

Description

This command allows the TE to specify a Quality of Service Profile that is used when the MT sends an Activate PDP Context Request message to the network.

The set command specifies a profile for the context identified by the (local) context identification parameter, <cid>. Since this is the same parameter that is used in the +CGDCONT and +CGDSCONT commands, the +CGQREQ command is effectively an extension to these commands. The QoS profile consists of a number of parameters, each of which may be set to a separate value.

A special form of the set command, +CGQREQ= <cid> causes the requested profile for context number <cid> to become undefined.

The read command returns the current settings for each defined context.

The test command returns values supported as a compound value. If the MT supports several PDP types, the parameter value ranges for each PDP type are returned on a separate line.

Defined values

<cid>: a numeric parameter which specifies a particular PDP context definition (see the +CGDCONT and +CGDSCONT commands).

The following parameters are defined in GSM 03.60 -

<precedence>: a numeric parameter which specifies the precedence class

<delay>: a numeric parameter which specifies the delay class

<reliability>: a numeric parameter which specifies the reliability class

<peak>: a numeric parameter which specifies the peak throughput class

<mean>: a numeric parameter which specifies the mean throughput class

If a value is omitted for a particular class then the value is considered to be unspecified.

Informative examples

-Initial the HyperTerminal

-Initial the MS

-AT Command

1.Query +CGQREQ Support

AT+CGQREQ=?

+CGQREQ: "IP",(1-3),(1-4),(1-5),(1-9),(1-18,31)

OK

2. Set +CGQREQ

AT+CGQREQ =1,1,1,1,1,1

OK

AT+CGQREQ?

+CGQREQ: 1,1,1,1,1,1

OK

2.5.3 Quality of Service Profile (Minimum acceptable) +CGQMIN

Table : +CGQMIN parameter command syntax

Command	Possible Response(s)
+CGQMIN=[<cid> [,<precedence > [,<delay> [,<reliability.> [,<peak> [,<mean>]]]]]]	OK ERROR

+CGQMIN?	+CGQMIN: <cid>, <precedence>, <delay>, <reliability>, <peak>, <mean> [<CR><LF>+CGQMIN: <cid>, <precedence >, <delay>, <reliability.>, <peak>, <mean> […]]
+CGQMIN=?	+CGQMIN: <PDP_type>, (list of supported <precedence>s), (list of supported <delay>s), (list of supported <reliability>s) , (list of supported <peak>s), (list of supported <mean>s) [<CR><LF>+CGQMIN: <PDP_type>, (list of supported <precedence>s), (list of supported <delay>s), (list of supported <reliability>s) , (list of supported <peak>s), (list of supported <mean>s) […]]

Description

This command allows the TE to specify a minimum acceptable profile which is checked by the MT against the negotiated profile returned in the Activate PDP Context Accept message.

The set command specifies a profile for the context identified by the (local) context identification parameter, <cid>. Since this is the same parameter that is used in the +CGDCONT and +CGDSCONT commands, the +CGQMIN command is effectively an extension to these commands. The QoS profile consists of a number of parameters, each of which may be set to a separate value.

A special form of the set command, +CGQMIN= <cid> causes the minimum acceptable profile for context number <cid> to become undefined. In this case no check is made against the negotiated profile.

The read command returns the current settings for each defined context.

The test command returns values supported as a compound value. If the MT supports several PDP types, the parameter value ranges for each PDP type are returned on a separate line.

Defined values

<cid>: a numeric parameter which specifies a particular PDP context definition (see the +CGDCONT and +CGDSCONT commands).
The following parameters are defined in GSM 03.60 -
<precedence>: a numeric parameter which specifies the precedence class
<delay>: a numeric parameter which specifies the delay class
<reliability>: a numeric parameter which specifies the reliability class
<peak>: a numeric parameter which specifies the peak throughput class
<mean>: a numeric parameter which specifies the mean throughput class
If a value is omitted for a particular class then this class is not checked.

Informative examples

-Initial the HyperTerminal
-Initial the MS
-AT Command

1.Query +CGQMIN Support

AT+CGQMIN=?
+CGQMIN: "IP",(1-3),(1-4),(1-5),(1-9),(1-18,31)
OK

2. Set +CGQMIN

AT+CGQMIN=1,1,1,1,1,1
OK

AT+CGQMIN?
+CGQMIN: 1,1,1,1,1,1
OK

AT+CGQMIN=1,0,1,1,1,1
OK
AT+CGQMIN?
+CGQMIN: 1,0,1,1,1,1
OK

©2004 BenQ Corporation. Confidential Property

2.5.4 GPRS attach or detach +CGATT

Table: +CGATT action command syntax

Command	Possible Response(s)
+CGATT= [<state>]	OK ERROR
+CGATT?	+CGATT: <state>
+CGATT=?	+CGATT: (list of supported <state>s)

Description

The execution command is used to attach the MT to, or detach the MT from, the Packet Domain service. After the command has completed, the MT remains in V.25ter command state. If the MT is already in the requested state, the command is ignored and the OK response is returned. If the requested state cannot be achieved, an ERROR or +CME ERROR response is returned. Extended error responses are enabled by the +CMEE command.

Any active PDP contexts will be automatically deactivated when the attachment state changes to detached.

The read command returns the current Packet Domain service state.
The test command is used for requesting information on the supported Packet Domain service states.

NOTE: This command has the characteristics of both the V.25ter action and parameter commands. Hence it has the read form in addition to the execution/set and test forms.

Defined Values

<state>: indicates the state of PS attachment
0 - detached
1 - attached
Other values are reserved and will result in an ERROR response to the execution command.

Informative examples

-Initial the HyperTerminal

-Initial the MS

-AT Command

1.Query +CGATT Support

AT+CGATT=?

+CGATT: (0,1)

OK

2. Set +CGATT

AT+CGATT=1

OK

AT+CGATT?

+CGATT: 1

OK

2.5.5 PDP context activate or deactivate +CGACT

Table: +CGACT action command syntax

Command	Possible Response(s)
+CGACT=[<state>[,<cid>[,<cid>[,…]]]]	OK ERROR
+CGACT?	+CGACT: <cid>, <state> [<CR><LF>+CGACT: <cid>, <state> [...]]
+CGACT=?	+CGACT: (list of supported <state>s)

Description

The execution command is used to activate or deactivate the specified PDP context (s). After the command has completed, the MT remains in V.25ter command state. If any PDP context is already in the requested state, the state for that context remains unchanged. If the requested state for any specified context cannot be achieved, an ERROR or +CME ERROR response is returned. Extended error responses are enabled by the +CMEE command. If the MT is not PS attached when the activation form of the command is executed, the MT first performs a PS attach and them attempts to activate the specified contexts. If the attach fails then the MT responds with ERROR or, if extended error responses are enabled, with the appropriate failure-to-attach error message.

©2004 BenQ Corporation. Confidential Property

If no <cid>s are specified the activation form of the command activates all defined contexts.
If no <cid>s are specified the deactivation form of the command deactivates all active contexts.

An active secondary context can exist if and only if the corresponding active primary context exists. If the primary PDP context associated with a PDP address is deactivated, all the associated secondary contexts are deactivated too and the data transfer for that PDP address is disabled.

The read command returns the current activation states for all the defined PDP contexts.

The test command is used for requesting information on the supported PDP context activation states.

NOTE. This command has the characteristics of both the V.25ter action and parameter commands. Hence it has the read form in addition to the execution/set and test forms.

Defined Values
<state>: indicates the state of PDP context activation
0 - deactivated
1 - activated
Other values are reserved and will result in an ERROR response to the execution command.

<cid>: a numeric parameter which specifies a particular PDP context definition (see the +CGDCONT and +CGDSCONT commands).

Informative examples
-Initial the HyperTerminal
-Initial the MS
-AT Command
1.Query +CGACT Support
AT+CGACT =?
+CGACT: (0,1)

OK

2.Set +CGACT

AT+CGACT =1

OK

AT+CGACT?

+CGACT: 1,1

OK

2.5.6 Enter data state +CGDATA

Table: +CGDATA action command syntax

Command	Possible Response(s)
+CGDATA=[<L2P> ,[<cid> [,<cid> [,…]]]]	CONNECT ERROR
+CGDATA=?	+CGDATA: (list of supported <L2P>s)

Description

The execution command causes the MT to perform whatever actions are necessary to establish communication between the TE and the network using one or more Packet Domain PDP types. This may include performing a PS attach and one or more PDP context activations. If the <L2P> parameter value is unacceptable to the MT, the MT shall return an ERROR or +CME ERROR response. Otherwise, the MT issues the intermediate result code CONNECT and enters V.25ter online data state.

Commands following +CGDATA command in the AT command line shall not be processed by the MT.

The detailed behavior after the online data state has been entered is dependent on the PDP type. It is described briefly in 3GPP TS 27.060[34] and in more detail in 3GPP TS 29.061[39] and the specifications for the relevant PDPs. PS attachment and PDP context activation procedures may take place prior to or during the PDP startup if they have not already been performed using the +CGATT and +CGACT commands.

If context activation takes place during the PDP startup, one or more <cid>s may be specified in order to provide the information needed for the context activation request(s).

During each PDP startup procedure the MT may have access to some or all of the following information –

The MT may have a priori knowledge, for example, it may implement only one PDP type.
The command may have provided an <L2P> parameter value. The TE may provide a PDP type and/or PDP address to the MT during in the PDP startup procedure. If any of this information is in conflict, the command will fail.

Any PDP type and/or PDP address present in the above information shall be compared with the PDP type and/or PDP address in any context definitions specified in the command in the order in which their <cid>s appear. For a context definition to match -

The PDP type must match exactly.

The PDP addresses are considered to match if they are identical or if either or both addresses are unspecified. For example, a PPP NCP request specifying PDP type = IP and no PDP address would cause the MT to search through the specified context definitions for one with PDP type = IP and any PDP address.

The context shall be activated using the matched value for PDP type and a static PDP address if available, together with the other information found in the PDP context definition. If a static PDP address is not available then a dynamic address is requested.

If no <cid> is given or if there is no matching context definition, the MT shall attempt to activate the context with whatever information is available to the MT. The other context parameters shall be set to their default values.

If the activation is successful, data transfer may proceed.
After data transfer is complete, and the layer 2 protocol termination procedure has completed successfully, the V.25ter command state is re-entered and the MT returns the final result code OK.

In the event of an erroneous termination or a failure to start up, the V.25ter

©2004 BenQ Corporation. Confidential Property

command state is re-entered and the MT returns the final result code NO CARRIER or, if enabled, +CME ERROR. Attach, activate and other errors may be reported.

The test command is used for requesting information on the supported layer 2 protocols.

This command may be used in both normal and modem compatibility modes.

Defined Values

<L2P>: a string parameter that indicates the layer 2 protocol to be used between the TE and MT

NULL none, for PDP type OSP:IHOSS

PPP Point-to-point protocol for a PDP such as IP

PAD character stream for X.25 character (triple X PAD) mode

X25 X.25 L2 (LAPB) for X.25 packet mode

M-xxxx manufacturer-specific protocol (xxxx is an alphanumeric string)

If the value is omitted, the layer 2 protocol is unspecified. Other values are reserved and will result in an ERROR response.

<cid>: a numeric parameter which specifies a particular PDP context definition (see the +CGDCONT and +CGDSCONT commands).

Informative examples

-Initial the HyperTerminal

-Initial the MS

-AT Command

1.Query +CGDATA Support

AT+CGDATA=?

+CGDATA: "PPP"

OK

2.5.7 Show PDP address +CGPADDR

Table: +CGPADDR action command syntax

Command	Possible response(s)

+CGPADDR=[<cid> [,<cid>[,…]]]	+CGPADDR: <cid>,<PDP_addr>[<CR><LF>+CGPADDR: <cid>,<PDP_addr> [...]]
+CGPADDR=?	+CGPADDR: (list of defined <cid>s)

Description

The execution command returns a list of PDP addresses for the specified context identifiers.

The test command returns a list of defined <cid>s.

Defined values

<cid>: a numeric parameter which specifies a particular PDP context definition (see the +CGDCONT and +CGDSCONT commands). If no <cid> is specified, the addresses for all defined contexts are returned.

<PDP_address>: a string that identifies the MT in the address space applicable to the PDP. The address may be static or dynamic. For a static address, it will be the one set by the +CGDCONT and +CGDSCONT commands when the context was defined. For a dynamic address it will be the one assigned during the last PDP context activation that used the context definition referred to by <cid>. <PDP_address> is omitted if none is available.

Informative examples

-Initial the HyperTerminal

-Initial the MS

-AT Command

1.Query +CGPADDR Support

AT+CGPADDR=?

+CGPADDR: (1)

OK

2.Set +CGPADDR

AT+CGPADDR =0

+CGPADDR: 1

OK

AT+CGPADDR =2

+CGPADDR: 2

OK

AT+CGPADDR =1
+CGPADDR: 1
OK

2.5.8 Automatic response to a network request for PDP context activation +CGAUTO

Table: +CGAUTO parameter command syntax

Command	Possible response(s)
+CGAUTO=[<n>]	OK ERROR
+CGAUTO?	+CGAUTO: <n>
+CGAUTO=?	+CGAUTO: (list of supported <n>s)

Description

The set command disables or enables an automatic positive response (auto-answer) to the receipt of a Request PDP Context Activation message from the network. It also provides control over the use of the V.25ter basic commands 'S0', 'A and 'H' for handling network requests for PDP context activation. The setting does not affect the issuing of the unsolicited result code RING or +CRING.

The test command returns the values of <n> supported by the MT as a compound value.

When the +CGAUTO=0 command is received, the MT shall not perform a PS detach if it is attached. Subsequently, when the MT announces a network request for PDP context activation by issuing the unsolicited result code RING or +CRING, the TE may manually accept or reject the request by issuing the +CGANS command or may simply ignore the network request.

When the +CGAUTO=1 command is received, the MT shall attempt to perform a PS attach if it is not already attached. Failure will result in ERROR or, if enabled, +CME ERROR being returned to the TE. Subsequently, when the MT announces a network request for PDP context activation by issuing the unsolicited result code RING or +CRING to the TE, this is followed by the intermediate result code CONNECT. The MT then enters V.25ter online data state and follows the same

©2004 BenQ Corporation. Confidential Property

procedure as it would after having received a +CGANS=1 with no <L2P> or <cid> values specified.

Defined values

<n>:

0 turn off automatic response for Packet Domain only

1 turn on automatic response for Packet Domain only

2 modem compatibility mode, Packet Domain only

3 modem compatibility mode, Packet Domain and circuit switched calls (default)

For <n> = 0 Packet Domain network requests are manually accepted or rejected by the +CGANS command.

For <n> = 1 Packet Domain network requests are automatically accepted according to the description above.

For <n> = 2, automatic acceptance of Packet Domain network requests is controlled by the 'S0' command. Manual control uses the 'A' and 'H' commands, respectively, to accept and reject Packet Domain requests. (+CGANS may also be used.) Incoming circuit switched calls can be neither manually nor automatically answered.

For <n> = 3, automatic acceptance of both Packet Domain network requests and incoming circuit switched calls is controlled by the 'S0' command. Manual control uses the 'A' and 'H' commands, respectively, to accept and reject Packet Domain requests. (+CGANS may also be used.) Circuit switched calls are handled as described elsewhere in this specification.

Informative examples

-Initial the HyperTerminal

-Initial the MS

-AT Command

1.Query +CGAUTO Support

AT+CGAUTO=?

+CGAUTO: (0-3)

OK

2. Set +CGAUTO

AT+CGAUTO =1

OK

AT+CGAUTO?

+CGAUTO: 1

©2004 BenQ Corporation. Confidential Property

OK
AT+CGAUTO =2
OK
AT+CGAUTO?
+CGAUTO: 2
OK

2.5.9 Manual response to a network request for PDP context activation +CGANS

Table: +CGANS action command syntax

Command	Possible response(s)
+CGANS=[<response>, [<L2P> ,[<cid>]]]	OK ERROR
+CGANS=?	+CGANS: (list of supported <response>s), (list of supported <L2P>s)

Description

The execution command requests the MT to respond to a network request for Packet Domain PDP context activation which has been signaled to the TE by the RING or +CRING: unsolicited result code. The <response> parameter allows the TE to accept or reject the request.

If <response> is 0, the request is rejected and the MT returns OK to the TE.

If <response> is 1, the following procedure is followed by the MT.

Commands following the +CGANS command in the AT command line shall not be processed by the MT.

If the <L2P> parameter value is unacceptable to the MT, the MT shall return an ERROR or +CME ERROR response. Otherwise, the MT issues the intermediate result code CONNECT and enters V.25ter online data state.

The detailed behavior after the online data state has been entered is dependent on the PDP type. It is described briefly in 3GPP TS 27.060[34] and in more detail in 3GPP TS 29.061[39] and the specifications for the relevant PDPs. PDP context activation procedures shall take place prior to or during the PDP startup.

One or more <cid>s may be specified in order to provide the values needed for the context activation request.

©2004 BenQ Corporation. Confidential Property

During the PDP startup procedure the MT has the PDP type and the PDP address provided by the network in the Request PDP Context Activation message. The MT may also have some or all of the following information -

The MT may have a priori knowledge, for example, it may implement only one PDP type.

The command may have provided an <L2P> parameter value.

The TE may provide one or both of PDP type and PDP address to the MT in the PDP startup.

If any of this information is in conflict, the command will fail.

If one or more <cid> is given then an attempt shall be made to identify an appropriate context definition by matching the PDP type and PDP address in the network request with the PDP type and PDP address in each of the specified context definitions (in the order in which their <cid>s appear in the command) as follows -

The PDP type must match exactly.

The PDP addresses are considered to match if they are identical or if the address in the context definition is unspecified.

The context shall be activated using the values for PDP type and PDP address provided by the network, together with the other information found in the PDP context definition. An APN may or may not re required, depending on the application.

If no <cid> is given or if there is no matching context definition, the MT will attempt to activate the context using the values for PDP type and PDP address provided by the network, together with any other relevant information known to the MT. The other context parameters will be set to their default values.

If the activation is successful, data transfer may proceed.

After data transfer is complete, and the layer 2 protocol termination procedure has completed successfully, the V.25ter command state is re-entered and the MT returns the final result code OK

In the event of an erroneous termination or a failure to startup, the V.25ter command state is re-entered and the MT returns the final result code NO CARRIER or, if enabled, +CME ERROR. Attach, activate and other errors may be reported. It is also an error to issue the +CGANS command when there is no outstanding network request.

NOTE: This is not the same as if the MT issues a +CGDATA (or +CGACT) command after receiving a +CRING unsolicited result code. A +CGDATA (or +CGACT) does not command the MT to acknowledge the network request but rather to make a new request for context activation. The network request would be

©2004 BenQ Corporation. Confidential Property

ignored.
The test command returns the values of <response> and <L2P> supported by the MT as compound values.
This command may be used in both normal and modem compatibility modes.

Defined values
<response>: is a numeric parameter which specifies how the request should be responded to.
0 reject the request
1 accept and request that the PDP context be activated
If <response> is omitted it is assumed to be 0. Other values are reserved and will result in the ERROR response.
<L2P>: a string parameter which indicates the layer 2 protocol to be used (see +CGDATA command).
<cid>: a numeric parameter which specifies a particular PDP context definition (see the +CGDCONT and +CGDSCONT commands).

Informative examples
-Initial the HyperTerminal
-Initial the MS
-AT Command
1.Query +CGANS Support
AT+CGANS=?
+CGANS: (0,1),("PPP")
OK

2.5.10 GPRS mobile station class +CGCLASS (GPRS only)

Table: +CGCLASS parameter command syntax

Command	Possible Response(s)
+CGCLASS= [<class>]	OK ERROR
+CGCLASS?	+CGCLASS: <class>
+CGCLASS=?	+CGCLASS: (list of supported <class>s)

Description

The set command is used to set the MT to operate according to the specified GPRS mobile class. If the requested class is not supported, an ERROR or +CME ERROR response is returned. Extended error responses are enabled by the +CMEE command.
The read command returns the current GPRS mobile class.
The test command is used for requesting information on the supported GPRS mobile classes.

Defined Values

<class>: a string parameter which indicates the GPRS mobile class (in descending order of functionality)

A class A (highest)
B class B
C class C in GPRS and circuit switched alternate mode
CG class C in GPRS only mode
CC class C in circuit switched only mode (lowest)

Other values are reserved and will result in an ERROR response to the set command.
If the MT is GPRS attached when the set command is issued with a <class> = CC specified, a detach request shall be sent to the network.

Informative examples

-Initial the HyperTerminal
-Initial the MS
-AT Command

1.Query +CGCLASS Support

AT+CGCLASS =?
+CGCLASS: ("B","C","CG","CC")
OK

2.Set +CGCLASS

AT+CGCLASS ="C"
OK
AT+CGCLASS?
+CGCLASS: "CG"
OK
AT+CGCLASS ="CC"
OK

AT+CGCLASS?
+CGCLASS: "CG"
OK

2.5.11 Packet Domain event reporting +CGEREP

Table: +CGEREP parameter command syntax

Command	Possible response(s)
+CGEREP=[<mode>[,<bfr>]]	OK ERROR
+CGEREP?	+CGEREP: <mode>,<bfr>
+CGEREP=?	+CGEREP: (list of supported <mode>s),(list of supported <bfr>s)

Description

Set command enables or disables sending of unsolicited result codes, +CGEV: XXX from MT to TE in the case of certain events occurring in the Packet Domain MT or the network. <mode> controls the processing of unsolicited result codes specified within this command. <bfr> controls the effect on buffered codes when <mode> 1 or 2 is entered. If a setting is not supported by the MT, ERROR or +CME ERROR: is returned.

Read command returns the current mode and buffer settings

Test command returns the modes and buffer settings supported by the MT as compound values.

Defined values

<mode>:

0 buffer unsolicited result codes in the MT; if MT result code buffer is full, the oldest ones can be discarded. No codes are forwarded to the TE.

1 discard unsolicited result codes when MT-TE link is reserved (e.g. in on-line data mode); otherwise forward them directly to the TE

2 buffer unsolicited result codes in the MT when MT-TE link is reserved (e.g. in on-line data mode) and flush them to the TE when MT-TE link becomes available; otherwise forward them directly to the TE

<bfr>:

0 MT buffer of unsolicited result codes defined within this command is cleared when <mode> 1 or 2 is entered

©2004 BenQ Corporation. Confidential Property

1 MT buffer of unsolicited result codes defined within this command is flushed to the TE when <mode> 1 or 2 is entered (OK response shall be given before flushing the codes)

Defined events

The following unsolicited result codes and the corresponding events are defined -

+CGEV: REJECT <PDP_type>, <PDP_addr>

A network request for PDP context activation occurred when the MT was unable to report it to the TE with a +CRING unsolicited result code and was automatically rejected.

+CGEV: NW REACT <PDP_type>, <PDP_addr>, [<cid>]

The network has requested a context reactivation. The <cid> that was used to reactivate the context is provided if known to the MT.

+CGEV: NW DEACT <PDP_type>, <PDP_addr>, [<cid>]

The network has forced a context deactivation. The <cid> that was used to activate the context is provided if known to the MT.

+CGEV: ME DEACT <PDP_type>, <PDP_addr>, [<cid>]

The mobile equipment has forced a context deactivation. The <cid> that was used to activate the context is provided if known to the MT.

+CGEV: NW DETACH

The network has forced a PS detach. This implies that all active contexts have been deactivated. These are not reported separately.

+CGEV: ME DETACH

The mobile equipment has forced a PS detach. This implies that all active contexts have been deactivated. These are not reported separately.

+CGEV: NW CLASS <class>

The network has forced a change of MS class. The highest available class is reported (see +CGCLASS).

+CGEV: ME CLASS <class>

The mobile equipment has forced a change of MS class. The highest available class is reported (see +CGCLASS).

Informative examples

-Initial the HyperTerminal

-Initial the MS

-AT Command

1.Query +CGEREP Support

AT+CGEREP=?

+CGEREP: (0-2),(0,1)
OK

2. Set +CGEREP
AT+CGEREP=1,0
OK
AT+CGEREP?
+CGEREP: 1,0
OK

AT+CGEREP=1,1
OK
AT+CGEREP?
+CGEREP: 1,1
OK

2.5.12 RS network registration status +CGREG

Table: +CGREG parameter command syntax

Command	Possible response(s)
+CGREG=[<n>]	
+CGREG?	+CGREG: <n>,<stat>[,<lac>,<ci>] *+CME ERROR: <err>*
+CGREG=?	+CGREG: (list of supported <n>s)

Description
The set command controls the presentation of an unsolicited result code +CGREG: <stat> when <n>=1 and there is a change in the MT's GPRS network registration status, or code +CGREG: <stat>[,<lac>,<ci>] when <n>=2 and there is a change of the network cell.
NOTE. If the GPRS MT also supports circuit mode services, the +CREG command and +CREG: result code apply to the registration status and location information for those services.
The read command returns the status of result code presentation and an integer

<stat> which shows whether the network has currently indicated the registration of the MT. Location information elements <lac> and <ci> are returned only when <n>=2 and MT is registered in the network.

Defined values

<n>:

0 disable network registration unsolicited result code

1 enable network registration unsolicited result code +CGREG: <stat>

2 enable network registration and location information unsolicited result code +CGREG: <stat>[,<lac>,<ci>]

<stat>:

0 not registered, ME is not currently searching an operator to register to

The MS is in GMM state GMM-NULL or GMM-DEREGISTERED-INITIATED.

The GPRS service is disabled, the MS is allowed to attach for GPRS if requested by the user.

1 registered, home network

The MS is in GMM state GMM-REGISTERED or

GMM-ROUTING-AREA-UPDATING-INITIATED INITIATED on the home PLMN.

2 not registered, but ME is currently trying to attach or searching an operator to register to

The MS is in GMM state GMM-DEREGISTERED or

GMM-REGISTERED-INITIATED. The GPRS service is enabled, but an allowable PLMN is currently not available. The MS will start a GPRS attach as soon as an allowable PLMN is available.

3 registration denied

The MS is in GMM state GMM-NULL. The GPRS service is disabled, the MS is not allowed to attach for GPRS if requested by the user.

4 unknown

5 registered, roaming

The MS is in GMM state GMM-REGISTERED or

GMM-ROUTING-AREA-UPDATING-INITIATED on a visited PLMN.

<lac>: string type; two byte location area code in hexadecimal format (e.g. "00C3" equals 195 in decimal)

<ci>: string type; two byte cell ID in hexadecimal format

Informative examples

-Initial the HyperTerminal

-Initial the MS

©2004 BenQ Corporation. Confidential Property

-AT Command

1.Query +CGREG Support

AT+CGREG=?
+CGREG: (0-2)
OK

2.Set +CGREG

AT+CGREG=1
OK
AT+CGREG?
+CGREG: 1, 0
OK
AT+CGREG=2
OK
AT+CGREG?
+CGREG: 2, 0
OK

2.5.13 Select service for MO SMS messages +CGSMS

Table: +CGSMS parameter command syntax

Command	Possible Response(s)
+CGSMS= [<service>]	OK ERROR
+CGSMS?	+CGSMS: <service>
+CGSMS=?	+CGSMS: (list of currently available <service>s)

Description

The set command is used to specify the service or service preference that the MT will use to send MO SMS messages.
The read command returns the currently selected service or service preference.
The test command is used for requesting information on the currently available services and service preferences.

Defined Values

<service>: a numeric parameter which indicates the service or service preference to be used

0 Packet Domain
1 circuit switched
2 Packet Domain preferred (use circuit switched if GPRS not available)
3 circuit switched preferred (use Packet Domain if circuit switched not available)

Other values are reserved and will result in an ERROR response to the set command.

Informative examples

-Initial the HyperTerminal
-Initial the MS
-AT Command

1.Query +CGSMS Support

AT+CGSMS=?
+CGSMS: (0-3)
OK

2.Set +CGSMS

AT+CGSMS=1
OK
AT+CGSMS?
+CGSMS: 1
OK
AT+CGSMS=0
OK
AT+CGSMS?
+CGSMS: 0
OK

2.5.14 Request GPRS service 'D'

Table: D command syntax

Command	Possible Response(s)
D*<GPRS_SC>[*[<called_address>][*[<L2P>][*[<cid>]]]]	CONNECT ERROR

Description

This command causes the MT to perform whatever actions are necessary to establish communication between the TE and external PDN.

The V.25ter'D'(Dial) command causes the MT to enter the V.25ter online data state and, with the TE, to start the specified layer2 protocol. The Mt shall return CONNECT to confirm acceptance of the command prior to entering the V.25ter online data state. No further commands may follow on the AT command line.

The detailed behavior after the online data state has been entered is dependent on the PDP type. It is described briefly in clauses 8 (for X.25) and 9 (for IP) of GSM 07.06. GPRS attachment and PDP context activation procedures may take place prior to or during the PDP startup if they have not already been performed using the +CGATT and +CGACT commands.

When the layer 2 protocol has terminated, either as a result of orderly shut down of the PDP or an error, the MT shall enter V.25ter command state and return the NO CARRIER final result code.

If<called_address> is supported and provided, the MT shall automatically set up a virtual call to the specified address after the PDP context has been activated.

If <L2P> and <cid> are supported, their usage shall be the same as in the +CGDATA command. The +CGDCONT, +CGQREQ, etc. commands may then be used in the modem initialization AT command string to set values for PDP type, APN, QoS etc.

If <L2P> is not supported of is supported but omitted, the MT shall use a layer 2 protocol appropriate to the PDP type.

If <cid> is not supported of is supported but omitted, the MT shall attempt to activate the context using:

(a) any information provided by the TE during the PDP startup procedure, e.g. the TE may provide a PDP type and/or PDP address to the MT,

or (b) a prior knowledge, e.g. the MT may implement only one PDP type,

or (c) using the 'Empty PDP type' (GSM 04.08). (No PDP address or APN shall be sent in this case and only one PDP context subscription record shall be present in the HLR for this subscriber.)

This command may be used in both normal and modem compatibility modes.

NOTE:

The dial string conforms to the syntax specified in GSM 02.30.

Defined Values

<GPRS_SC>: (GPRS Service Code) a digit string (value 99) which identifies a request to use the GPRS

<called_address>: a string that identifies thecalled party in the address space

applicable to the PDP. For communications software that does not support arbitrary characters in the dial string, a numeric equivalent may be used. Also, the character comma',' . May be used as a substitute for the character period'.'.

[<host>][@[<port>][@[<protocol>]]]

where <host>, <port> and <protocol> are defined in the +CGDCONT description. For communications software that does not support arbitrary characters in the dial string, a numeric equivalent may be used. However, this should be avoided if at all possible.

<L2P>: a string which indicates the layer 2 protocol to be used (see +CGDATA command). For communications software that does not support arbitrary characters in the dial string, a numeric equivalent shall be used:

0	NULL
1	PPP
2	PAD
3	X25
9yyyy	M-xxxx

Other values are reserved and will result in an ERROR response to the set command.

NOTE: V.250 (and certain communications software) does not permit arbitrary characters in the dial string. The <L2P> and <called_address> strings are therefore specified as containing digits (0-9) only.

<cid> : a digit string which specifies a particular PDP context definition (see +CGDCONT command).

2.5.15 Automatic response to a network request for PDP context activation 'S0'

The V.25ter 'S0=n' (Automatic answer) command may be used to turn off (n=0) and on (n>0) the automatic response to a network request for a PDP context activation.

When the 'S0=n' (n>0) command is received, the MT shall attempt ts perform a GPRS attach if it is not already attached. Failure will result in ERROR being returned to the TE. Subsequently, the MT will announce a network request for PDP context activation by issuing the unsolicited result code Ring to the TE, followed by the intermediate result code CONNECT. The MT then enters V.25ter online data state and follows the same procedure as it would after having received a +CGANS=1 with no <L2P> or <cid> values specified.

©2004 BenQ Corporation. Confidential Property

NOTE: The ‘S0=n’ (n=0) command does not perform an automatic GPRS detach.

Informative examples

-Initial the HyperTerminal

-Initial the MS

-AT Command

1.Query S0 Support

ATS0=?

S0(0-255)

OK

2.Set S0=1

ATS0=1

OK

ATS0?

001

OK

2.5.16 Manual acceptance of a network request for PDP context activation ‘A’

The V.25ter ‘A’ (Answer) command may be used to accept a network request for a PDP context activation announced by the unsolicited result code RING. The MT responds with CONNECT, enters V.25ter online data state and follows the same procedure as it would after having received a +CGANS=1 with no <cid> values specified. It is an error to issue the ‘A’ command when there is no outstanding network request.

Informative examples

-Initial the HyperTerminal

-Initial the MS

-AT Command

Ring

ATA

OK

©2004 BenQ Corporation. Confidential Property

2.5.17 Manual rejection of a network request for PDP context activation ‘H’

The V.25ter ‘H’ or ‘H0’ (On-hook) command may be used to reject a network request for PDP context activation announced by the unsolicited result code RING. The MT responds with OK. It is an error to issue the ‘H’ command when there is no outstanding network request.

NOTE: This is an extension to the usage of the ‘H’ command that is described in ITU-T V.25ter.

Informative examples

-Initial the HyperTerminal

-Initial the MS

-AT Command

ATD0921214863;

OK

ATH

OK

2.6 Module-specific AT Commands

2.6.1 Power Off $POWEROFF

Table: $POWEROFF parameter command syntax

Command	Possible response(s)
$POWEROFF	OK

Description

This command is used to power off the module. After this command, the user has to press the power key to power on the module.

Defined values

Listing the parameters and defining the values

Informative examples

/* power off the module */
AT$POWEROFF
OK

2.6.2 Periodic Signal Quality Report $CSQ

Table: $CSQ parameter command syntax

Command	Possible response(s)
$CSQ : <rssi>, <ber>	OK
$CSQ = <mode> [,<cycle>]	OK
$CSQ =?	$CSQ: (list of supported <mode>), (list of supported <cycle>)

Description

This command is used to start or stop periodic signal quality report.

Defined values

Listing the parameters and defining the values

<rssi>: received signal strength indication

©2004 BenQ Corporation. Confidential Property

0	-113dBm or less
1	-111dBm
2…30	-109dBm ~ -53dBm
31	-51dBm or greater
99	Not known or not detectable

Mode

0	Stop
1	Start

Cycle

1-255 (seconds), default is 5 (seconds)

Informative examples

/* Start periodic signal quality report for every 10 seconds */

AT$CSQ=1,10

OK

$CSQ: 26, 99 /* After 10 seconds */

$CSQ: 29, 99 /* After 10 seconds */

/* Stop periodic signal quality report */

AT$CSQ=0

OK

2.6.3 Audio Path $AUPATH

Table: $AUPATH parameter command syntax

Command	Possible response(s)
$AUPATH= <path>, <mode>	$AUPATH: 1 OK
$AUPATH =?	$AUPATH: (list of supported <path>), (list of supported <mode>)
$AUPATH?	$AUPATH: (list of current audio mode, list of current audio path)

Description

This command is used to control audio path. There are several combinations of the audio input device and audio output device.

Defined values

Listing the parameters and defining the values

Path

0: Main path (EARN, EARP, MICIN, MICIP, MICBIAS), loop
Voice input from MIC will output to EAR. For test purpose
1: Auxiliary path (AUXI, AUXOP, MICBIAS), loop
Voice input from AUXI will output to AUXOP. For test purpose
2: Auxiliary path (AUXI, AUXOP, MICBIAS), speech
3: Main path (EARN, EARP, MICIN, MICIP, MICBIAS), speech
4: EARN, EARP, AUXOP, MICIN, MICBIAS on, speech
5: AUXOP, MICIN, MICIP, MICBIAS on, speech
6: EARN, EARP, AUXI, MICBIAS, on, speech

Mode

0: OFF
1: ON

Informative examples

/* open main path and loop, not in call */
AT$AUPATH=0,1
$AUPATH: 1
OK

/* open auxiliary path and loop, not in call */
AT$AUPATH=1,1
$AUPATH: 1
OK

/* open auxiliary path and speech in call */
AT$AUPATH=2,1
$AUPATH: 1
OK

©2004 BenQ Corporation. Confidential Property

2.6.4 Audio Gain $AUGAIN

Table: $AUGAIN parameter command syntax

Command	Possible response(s)
$AUGAIN= <path>, <gain>	$AUGAIN: 1 OK
$AUGAIN =?	$AUGAIN: (list of supported <path>), (list of supported <gain>)
$AUGAIN?	$AUGAIN: Sidetone (list of Sidetone <gain>), Mic (list of Mic <gain>), Speaker (list of Speaker <gain>)

Description

This command is used to control audio gain. Note that this command has to be used after audio path is configured by AT$AUPATH.

Defined values

Listing the parameters and defining the values

Path

0: Sidetone
1: Mic
2: Speaker

Gain: 1-9

1: Minimum gain
9: Maximum gain

AT$AUGAIN=0,0 will turn off side tone.

Informative examples

/* set audio gain*/
AT$AUGAIN=0, 5
$AUGAIN: 1
OK

©2004 BenQ Corporation. Confidential Property

2.6.5 Audio Mute $AUMUTE

Table: $AUMUTE parameter command syntax

Command	Possible response(s)
$AUMUTE= <mode>	$AUMUTE: 1 OK
$AUMUTE =?	$AUMUTE: (list of supported <mode>)

Description

This command is used to control microphone mute.

Defined values

Listing the parameters and defining the values

Mode

0: Mute off

1: Mute on

Informative examples

/* set mic mute */

AT$AUMUTE=1

$AUMUTE: 1

OK

2.6.6 Audio Volume $AUVOL

Table: $AUVOL parameter command syntax

Command	Possible response(s)
$AUVOL = <volume>	$AUVOL: 1 OK
$AUVOL =?	$AUVOL: (list of supported <volume>)
$AUVOL?	$AUVOL: (list of current <volume>)

Description

This command is used to control speaker volume.

Defined values

Listing the parameters and defining the values

Volume: 0-5

0: Mute

1: Minimum Volume

5: Maximum Volume

Informative examples

/* set volume */

AT$AUVOL=3

$AUVOL: 1

OK

2.6.7 Audio AEC $AUAEC

Table: $AUAEC parameter command syntax

Command	Possible response(s)
$AUAEC = <AEC_value>	OK
$AUAEC?	$AUAEC: (list of current AEC value)

Description

This command is used to configure the echo canceller (AEC). The AEC feature is the task to enable/disable Speech Enhancement (SPENH) and to tune the Echo canceller included in the audio path.

Defined values

Listing the parameters and defining the values

<AEC Value>: 0 - 1023

The bit field register is shown in the following.

Bit	**9**	**8**	**7**	**6**	**5**	**4**	**3**	**2**	**1**	**0**
Bin	1	X		0	0	0	0	1	1	X
Hex	2		0				6			
Dec	518									
Bit number	**Rule**									

0	**Don't Care**	
1	1: enable the AEC algorithm, 0: disable the AEC algorithm.	
2	1: enable the SPENH algorithm (noise suppression) 0: disable the SPENH algorithm (noise suppression)	
3-4	Set the additional echo suppression level	00: 0 dB
		01: 6 dB
		10: 12 dB
		11: 18 dB
5-6	Set the noise suppression level limitation	00: None
		01: -6 dB
		10: -12 dB
		11: -18 dB
7	**Don't Care**	
8	**Don't Care**	
9	1: AEC short echo canceller. (AEC_Mode) 0: AEC long echo canceller	

Table: Example of the AEC_value

Note that the bit 0, 7, and 8 are **don't care** in the field.

Example:

/* Enable AEC with Speech Enhancement algorithm*/

AT$AUAEC=518

OK

/* Disable AEC */

AT$AUAEC=516

OK

2.6.8 Audio FIR $AUFIR

Table: $AUFIR parameter command syntax

Command	Possible response(s)
$AUFIR =<value 0>, <value 1>, …., <value 30>	OK
$AUFIR=?	$AUFIR: (list of supported < value >)
$AUFIR?	$AUFIR: (list of current FIR value)

©2004 BenQ Corporation. Confidential Property

Description

This command is used to configure the FIR filter coefficient which the downlink (audio speaker) signal is be filtered.

Defined values

Listing the parameters and defining the values

<Value 0>, <Value 1>, …<Value 30>: 0 - 65535

The FIR coefficient value.

Example:

/* Set FIR coefficient */

AT$AUFIR=65514, 65424, 65381, 65389, 65399, 194, 713, 593, 444, 1416, 1206, 65526, 1481, 4031, 63490, 16384, 63490, 4031, 1481, 65526, 1206, 1416, 444, 593, 713, 194, 65399, 65389, 65381, 65424, 65514

OK

2.6.9 Audio VAD $AUVAD

Table: $AUVAD parameter command syntax

Command	Possible response(s)
$AUVAD = <VAD_value>	OK
$AUVAD=?	$AUVAD: (list of supported <value>)
$AUVAD?	$AUVAD: (list of current VAD value)

Description

This command is used to configure the VAD (voice activity detector) coefficient. VAD in the AEC algorithm is a simple algorithm based on energy computation with a memory effect on the far end signal. This VAD coefficient is a factor that is related to the current estimated energy.

Defined values

Listing the parameters and defining the values

<VAD Value>: 0 - 65535

The VAD coefficient value.

Example:

©2004 BenQ Corporation. Confidential Property

/* Set VAD coefficient */

AT$AUVAD=16384

OK

2.6.10 Audio ABS $AUABS

Table: $AUABS parameter command syntax

Command	Possible response(s)
$AUABS = <ABS_value>	OK
$AUABS=?	$AUABS: (list of supported <value>)
$AUABS?	$AUABS: (list of current ABS value)

Description

This command is used to configure the ABS coefficient. ABS coefficient is an absolute offset value that is related to the current estimated energy. The VAD algorithm finds the right VAD and ABS parameter in order to compensate effect of the FIR on the DL (downlink) signal.

Defined values

Listing the parameters and defining the values

<ABS Value>: 0 - 65535

The ABS coefficient value.

Example:

/* Set ABS coefficient */

AT$AUABS=16384

OK

2.6.11 Audio CONTFLT $AUCONTFLT

Table: $AUCONTFLT parameter command syntax

Command	Possible response(s)
$AUCONTFLT = <CONTFLT_value>	OK
$AUCONTFLT=?	$AUCONTFLT: (list of supported <value>)
$AUCONTFLT?	$AUCONTFLT: (list of current CONTFLT value)

Description

This command is used to configure the CONTFLT coefficient. CONTFLT coefficient is a Boolean value that can enable the continuous mode filtering.

Defined values

Listing the parameters and defining the values

<CONTFLT Value>: 0 - 1

The CONTFLT coefficient value.

Example:

/* Set CONTFLT coefficient */

AT$AUCONTFLT=1

OK

2.6.12 Audio AUATT $AUATT

Table: $AUATT parameter command syntax

Command	Possible response(s)
$AUATT = <ATT_value>	OK
$AUATT=?	$AUATT: (list of supported <value>)
$AUATT?	$AUATT: (list of current ATT value)

Description

This command is used to configure the ATT coefficient. ATT coefficient is the number of samples that granulates of the smoothed attenuation.

Defined values

Listing the parameters and defining the values

<ATT Value>: 0 - 65535

The ATT coefficient value.

Example:

/* Set ATT coefficient */

AT$AUATT=20

©2004 BenQ Corporation. Confidential Property

OK

2.6.13 Audio SMOOTH $AUSMOOTH

Table: $AUSMOOTH parameter command syntax

Command	Possible response(s)
$AUSMOOTH=<SMOOTH_value>	OK
$AUSMOOTH=?	$AUSMOOTH: (list of supported <value>)
$AUSMOOTH?	$AUSMOOTH: (list of current SMOOTH value)

Description

This command is used to configure the SMOOTH coefficient. The SMOOTH coefficient uses the ATT number of samples smoothing the far_end_power and far_end_noise.

Defined values

Listing the parameters and defining the values

<SMOOTH Value>: 0 - 65535

The SMOOTH coefficient value.

Example:

/* Set SMOOTH coefficient */

AT$AUSMOOTH=9830

OK

2.6.14 Audio LEVELMAX $AULEVELMAX

Table: $AULEVELMAX parameter command syntax

Command	Possible response(s)
$AULEVELMAX=<LEVELMAX_value>	OK
$AULEVELMAX=?	$AULEVELMAX: (list of supported <value>)
$AULEVELMAX?	$AULEVELMAX: (list of current LEVELMAX value)

Description

This command is used to configure the LEVELMAX coefficient. The LEVELMAX coefficient is the maximum number of attenuation level.

Defined values

Listing the parameters and defining the values

<LEVELMAX Value>: 0 - 65535

The LEVELMAX coefficient value.

Example:

/* Set LEVELMAX coefficient */

AT$AULEVELMAX=2704

OK

2.6.15 Audio FLT $AUFIL

Table: $AUFIL parameter command syntax

Command	Possible response(s)
$AUFIL=<FIL_value>	OK
$AUFIL=?	$AUFIL: (list of supported <value>)
$AUFIL?	$AUFIL: (list of current FIL value)

Description

This command is used to configure the FIL coefficient. The FIL coefficient is the modifying factor of far_end_noise for filtering decision.

Defined values

Listing the parameters and defining the values

<FLT Value>: 0 - 65535

The FLT coefficient value.

Example:

/* Set FLT coefficient */

AT$AUFLT=4096

OK

©2004 BenQ Corporation. Confidential Property

2.6.16 Audio MUT $AUMUT

Table: $AUMUT parameter command syntax

Command	Possible response(s)
$AUMUT=<MUT_value>	OK
$AUMUT=?	$AUMUT: (list of supported <value>)
$AUMUT?	$AUMUT: (list of current MUT value)

Description

This command is used to configure the MUT coefficient. The MUT coefficient is the modifying factor of far_end_noise for muting decision.

Defined values

Listing the parameters and defining the values

<MUT Value>: 0 - 65535

The MUT coefficient value.

Example:

/* Set MUT coefficient */

AT$AUMUT=4096

OK

2.6.17 SIM Ready Notification $SRN

Table: $SRN parameter command syntax

Command	Return
$SRN= <mode>	
$SRN?	$SRN: <mode>
$SRN=?	$SRN: <mode>

Description

This command is set to have a ready notification at startup time to denote the finish of reading SMS and phone book from SIM. Any abnormal condition such as PIN locked or absence of SIM card will cause an ERROR response.

Defined values

<mode>:

©2004 BenQ Corporation. Confidential Property

0: Disable the notification
1: Enable the notification

Example
-Initial the HyperTerminal
-Initial the MS
-AT Command

1. Query the current command status
AT$SRN=?
$SRN: 1
OK

2. Enable a PIN locked SIM card
AT$SRN=1
ERROR

3. Show the usage
AT$SRN=?
$SRN: (0,1)
OK

4. Enable the command
AT$SRN= 1
OK
$SRN: READY

5. Enable and timeout occur
AT$SRN=1
OK
$SRN: ERROR

2.6.18 I/O12 Setting $VCD

Table: $VCD parameter command syntax

Command	Return
$VCD=<mode>	
$VCD?	$VCD: <mode>

$VCD=?	$VCD: (list of supported <mode>s),

Description

This command is used to set the mode of I/O 12 to VCD mode.

Defined values

<mode>:

1: VCD mode (Voice Carrier Detect)

0: DCD mode (Data Carrier Detect)

Informative examples

-Initial the HyperTerminal

-Initial the MS

-AT Command

AT$VCD=1<CR>

OK

2.6.19 Set duration to clip data on incoming call $TRING

Table: $TRING parameter command syntax

Command	Return
$TRING=< duration >	
$TRING?	$TRING: < duration>
$TRING=?	$TRING: (list of supported < duration >s),

Description

This command is used to set duration to clip data on incoming call.

Defined values

< duration>:

duration: 500-5000 mSec

Informative examples

-Initial the HyperTerminal

-Initial the MS

-AT Command

AT$TRING=1000<CR>

OK

2.6.20 Convert UNICODE to GB2312 $UNI2GB

Table: $ UNI2GB parameter command syntax

Command	Return
$UNI2GB=”UNICODE”	GB2312
$UNI2GB=?	$UNI2GB=”UNICODE”

Description

This command is used to convert Unicode to GB2312.

Defined values

UNICODE:

UNICODE: UNICODE String

Informative examples

-Initial the HyperTerminal

-Initial the MS

-AT Command

AT$UNI2GB=”3044”<CR>　(中’ s UNICODE)

A4A4 (中’s GB2312)

OK

2.6.21 Convert GB2312 to UNICODE $GB2UNI

Table: $ GB2UNI parameter command syntax

Command	Return
$GB2UNI= “GB2312”	UNICODE
$ GB2UNI =?	$ GB2UNI =”GB2312”

Description

This command is used to convert GB2312 to Unicode.

Defined values

GB2312:

GB2312: GB2312 String

Informative examples

-Initial the HyperTerminal

-Initial the MS

-AT Command

AT$GB2UNI=”A4A4”<CR>　(中’s GB2312)

3044　(中’s UNICODE)

OK

2.6.22 Play a call tone +GDT

Table: +GDT parameter command syntax

Command	Return
+GDT=<TYPE>	OK, ERROR

Description

When <TYPE> =1 ~ 18, the MS will enable the <TYPE> of call tone. When <TYPE> =0, the MS will stop the call tone.

Defined values

<TYPE> : Call Tone Type

1. DIAL CALL TONE
2. AUTHENTICATION CALL TONE
3. RINGING CALL TONE
4. BUSY CALL TONE
5. CONGESTED CALL TONE
6. CALL DROP CALL TONE
7. DIAL CALL TONE
8. RADIO ACK CALL TONE
9. WAITING CALL TONE
10. TIMEALERT CALL TONE
11. AUTO REDIAL CALL TONE
12. TEST TONE CALL TONE
13. WARNING BEEP CALL TONE
14. RISING CALLTONE

©2004 BenQ Corporation. Confidential Property

15. FALLING CALL TONE
16. FORBID KEYPAD CALLTONE
17. POWER ON CALL TONE
18. ERROR PROMPT CALL TONE

Informative examples

-Initial the HyperTerminal

-Initial the MS

-AT Command

AT+GDT=1

OK

AT+GDT=0

OK

AT+GDT=3

OK

2.6.23 Hardware power off command $HRST

Table: $HRST parameter command syntax

Command	Return
$HRST=<isEnable>	
$HRST?	$HRST: < isEnable >
$HRST=?	$HRST: (list of supported < isEnable >s),

Description

When <isEnable> =0, it will not detect hardware poweroff procedure. When <isEnable> = 1, it will detect hardware reset procedure, the user can give ROW4 pin a pulse (30 ms), then pull down GPIO 13 (200 ms), the system will power off.

Defined values

<isEnable>: the parameter to enable/disable

0: disable

1: enable

Informative examples

-Initial the HyperTerminal

-Initial the MS

-AT Command

AT$HRST=1
OK

2.7 Proprietary AT Commands

2.7.1 Call progress information %CPI

Table: Syntax (%CPI)

Command	Possible response(s)
%CPI=<n>	
%CPI?	%CPI: <n>
%CPI=?	%CPI: (list of support <n>s)

Description

This command refers to call progress information, which is indicated by the network during call establishment. The set command enable/disables the presentation of unsolicited notification result codes from TA to TE.

When <n>=1 and a call progress information is received during a call establishment, intermediate result code %CPI: <cId>,<msgType>,<ibt>,<tch> is sent to TE. <cId> identifies the call in the call table. The value of <msgType> describes the layer 3 message type that was used to transfer the call progress information. The state of TCH assignment and the use of in-band tones for that call can be monitored by the values of <ibt> and <tch>.

When <n>=2 and a call progress information is received during a call establishment, intermediate result code %CPI: <cId>, <msgType>, <ibt>, <tch>, [<dir>], [<mode>], [<cli validity>] [,<number>[,<ton>][,<alpha>]] is sent to TE. <cId> identifies the call in the call table. The value of <msgType> describes the layer 3 message type that was used to transfer the call progress information. The state of TCH assignment and the use of in-band tones for that call can be monitored by the values of <ibt> and <tch>. <dir> describes the direction of the call. <CLI validity> describe the validity of calling line identification.The value of <mode> describes the mode of the call (e.g. voice or data). <number> is call number. The value of <toa>

describes the type of number (e.g. international number starting with '+'). <alpha> is the alpha identifier of the called number as stored in the phonebook.

Test command returns values supported by the TA as compound value.

Defined values

<n>: (parameter sets/shows the result code presentation status in the TA)

0 disable

1 enable

2 enable with call number information

<cId>: integer type; call identification number as described in GSM 02.30 subclause 4.5.5.1

<msgType>: (layer 3 message type)

0 setup message
1 disconnect message
2 alert message
3 call proceed message
4 synchronization message
5 progress message
6 call connected message

<ibt>: (status of the usage of in-band tones)

0 no in-band tones
1 in-band tones

<tch>: (TCH assignment)

0 TCH not assigned
1 TCH assigned

<dir>

0 Mobile originated call
1 Mobile terminated call

<mode>

0 Voice
1 Data
2 Fax
3 VFDVoice
4 VADVoice
5 VAFVoice

©2004 BenQ Corporation. Confidential Property

6 VFDData
7 VADData
8 VAFFax
9 unknown

<CLI validity>

0 CLI valid
1 CLI has been withheld by the originator
2 CLI is not available due to interworking problems or limitations of originating network.

<number>

number of dialed/connected call

<toa>

type of address octet (ton/npi)

<alpha>

alpha identifier of dialed/connected call if available in phonebook

Information examples

-Initial the HyperTerminal
-Initial the MS
-AT Command
When AT%CPI=1

(1) Make an outgoing call and accept the call

AT%CPI=1
ATD0921214863;
OK
%CPI: 1,4,0,1 (MO make the call -0921214863)
%CPI: 1,2,1,1
%CPI: 1,6,1,1 (MT accept the call)
%CPI: 1,1,0,1 (end the call)
NO CARRIER

(2) Make an outgoing call and reject the call

AT%CPI=1

©2004 BenQ Corporation. Confidential Property

ATD0921214863;
OK
%CPI: 1,4,0,1
%CPI: 1,2,1,1
%CPI: 1,5,1,1 (accept progress message)
ATH
OK

(3) Accept an incoming call

AT%CPI=1
RING
%CPI: 1,4,1,1
ATA
OK
%CPI: 1,0,1,0
RING
%CPI: 1,6,1,1 (accept the call)
ATH
OK

(4) Accept an incoming call and then make an outgoing call

AT%CPI=1
RING
%CPI: 1,4,1,1 (Synchronization message)
RING
ATA (accept an incoming call)
OK
RING
RING
%CPI: 1,6,1,1
ATD0921214863; (make an outgoing call)
OK
%CPI: 2,2,1,1
%CPI: 2,6,1,1 (accept the outgoing call)
ATH
OK

When AT%CPI=2

(1) Make an outgoing call and accept the call

ATD0921214863;

OK

%CPI: 1,4,0,1,0,0,,"0921214863",129 (MO make the call -0921214863)

%CPI: 1,2,1,1,0,0,,"0921214863",129

%CPI: 1,6,1,1,0,0,,"0921214863",129 (MT accept the call)

%CPI: 1,1,0,1

NO CARRIER

(2) Make an outgoing call and reject the call

ATD0921214863;

OK

%CPI: 1,4,0,1,0,0,,"0921214863",129

%CPI: 1,2,1,1,0,0,,"0921214863",129

%CPI: 1,5,1,1,0,0,,"0921214863",129 (MT reject the call and MO get progress message)

ATH

OK

(3) Accept an incoming call

%CPI: 1,0,1,0,1,0,1

RING

%CPI: 1,4,1,1,1,0,1 (Synchronization message)

ATA (accept the incoming call)

OK

RING

RING

%CPI: 1,6,1,1,1,0,1 (connect the call)

ATH (hang up the call)

OK

(4) Accept an incoming call and then make an outgoing call

%CPI: 1,0,1,0,1,0,1

RING

%CPI: 1,4,1,1,1,0,1

ATA (accept the incoming call)

OK

%CPI: 1,6,1,1,1,0,1 (connect the call)

©2004 BenQ Corporation. Confidential Property

ATD0921214863; (make an outgoing call-0921214863)
OK
%CPI: 2,2,1,1,0,0,1,"0921214863",129
%CPI: 2,6,1,1,0,0,1,"0921214863",129
%CPI: 2,1,0,1 (MT-0921214863 hang up)
NO CARRIER
ATH (hang up)
OK

2.7.2 Configuration for SIM application toolkit %SATC

Table: Syntax (%SATC)

Command	Possible response(s)
% SATC =<n>,<satPrfl>	
% SATC?	% SATC :<n>,<satPrfl>
% SATC =?	% SATC : (list of support <n>s),(prflLen)

Description

This command refers to the SIM application toolkit download mechanism, which is used to indicate to the SIM the features that the ME is capable of. The different features that are possible for a proactive SIM card are summarized by a table called a profile, refer to GSM 11.14 for more details. Condat's ACI, SMS and SIM modules already implement some of these features. Therefore the profile that is indicated by <satPrfl> will be combined with the existing one. The current profile setting could be displayed using the read command. <n> is used to enable/disable the presentation of unsolicited notification result codes from TA to TE.

When <n>=1 and one of the following conditions have occurred, the respective unsolicited result is sent to TE.

- A command received from the SIM that is not handled by ME is indicated to TE by %SATI: <satCmd>.
- The result to an envelope command, which was sent by TE, is indicated using the result %SATE: <satRsp>. For more information regarding the sending of envelope commands to SIM, lease refer to the %SATE command description.
- If SIM application toolkit tries to set up a call using the Set Up Call feature described in GSM 11.14, and the conditions for the call are checked by ME successfully, the call is indicated to TE using the result %SATA:

[<rdl>]. Using the accept command A, ME tries to establish the call, otherwise the hook-on command H rejects the pending SAT call and sends the respective

response to SIM.

- In general, commands or responses sent by ME to SIM or commands handled by ME are indicated to TE using the result %SATN: <satNtfy>. With these notifications, TE shall be able to indicate appropriate messages to a user.

Defined Values

<n>: (parameter sets/shows the result code presentation status in the TA)

<satPrfl>: string type; SIM application toolkit profile (hexadecimal format; refer +CSCS) starting with first byte of the profile.

<satCmd>: string type; SIM application toolkit command (hexadecimal format; refer +CSCS) starting with command tag.

<satRsp>: string type; SIM application toolkit response (hexadecimal format; refer +CSCS) starting with first byte of response data.

<satNtfy>: string type; commands or responses sent by ME to SIM or commands handled by ME (hexadecimal format; refer +CSCS) starting with first byte of response data or command tag.

<rdl>: integer type; if a pending SIM application toolkit command is alerted to TE using result %SATA:, the value of <rdl> indicates the redial timeout for the call in unit of milliseconds.

2.7.3 Send SAT envelope command %SATE

Table: Syntax (%SATE)

Command	Possible response(s)
% SATE=<satCmd>	% SATE :<satRsp>
% SATE =?	

Description

This command provides the possibility to send a command to the SIM, using the envelope mechanism of SIM application toolkit as described in GSM 11.14. If <satCmd> is present the contents is converted and send directly to SIM. The coding of the SIM command is the task of TE, no checking is done by ME. As soon as a response from the SIM is received, the contents is send to ME using the result %SATE: <satRsp>.

Defined Values

<satCmd>: string type; SIM application toolkit command (hexadecimal format; refer +CSCS) starting with command tag.

©2004 BenQ Corporation. Confidential Property

<satRsp>: string type; SIM application toolkit response (hexadecimal format; refer +CSCS) starting with first byte of response data.

2.7.4 Send SAT command response %SATR

Table: Syntax (%SATE)

Command	Possible response(s)
% SATR=<satRsp>	
% SATR =?	

Description

This command provides the possibility to send a response to previous received SAT command. If a SIM application toolkit command was indicated to TE using the result %SATI: <satCmd>, the TE should send an appropriate response using the %SATR command. If <satRsp> is present the contents is converted and send directly to SIM. The coding of the SIM response is the task of TE, no checking is done by ME.

Defined Values

<satRsp>: string type; SIM application toolkit response (hexadecimal format; refer +CSCS) starting with first byte of response data.

2.7.5 Terminate SAT command or session %SATT

Table: Syntax (%SATT)

Command	Possible response(s)
% SATT=<cs>	
% SATT =?	

Description

This command is used to terminate a SIM application toolkit command or session. If <cs> is present the value is coded and send to the SIM to erminate the command or session. For example, is a SAT Call Set up was indicated with the result %SATA: 60, and the redialing time is exceeded, TE shall send the cause 'end of redialing reached' to ME.

Defined Values

<cs>: (cause of command or session termination)

0 user stopped redialing

1 end of redialing reached

2 user ends session

2.7.6 Dynamic Multiband: %BAND

Table: Syntax (%BAND)

Command	Possible response(s)
%BAND	+CME ERROR: <err>
%BAND ?	%BAND: <mode>[,<band>]
%BAND=?	%BAND: (list of supported <mode>s), (list of supported <band>s)

Description

This command is used to manage which radio bands are to be scanned.

Defined Values

<mode>: set the radio band switch mode

0 automatic

1 manual

<band>: is a sum of integers each representing a band

1 GSM 900

2 DCS 1800

4 PCS 1900

8 E-GSM

16 GSM 850

Information examples

1. AT%BAND=1,15 // set MS to scan 900/1800/1900. For modules-based products, MS will re-register to the network automatically.

2.7.7 GPRS Attach/Detach Mode: %CGAATT

Table: Syntax (%CGAATT)

Command	Possible response(s)
%CGAATT=<attach_mod	+CME ERROR: <err>

e>[,<detach_mode>]	
%CGAATT?	%CGAATT : <attach_mode>,<detach_mode>
%CGAATT=?	%CGAATT: (list of supported <attach_mode>s), (list of supported <detach_mode>s)

Description

This command is used to set GPRS attach and detach mode. It does not force MS to attach or detach right away, instead, this command will take effect after next reboot. Note that the setting of AT%CGAATT=0,1 and AT%CGAATT=1,0 will be stored in the file system and still be valid after power-cycle; any other combination of setting, such as AT%CGAATT=0,0, is not stored in the file system.

Defined Values

`<attach_mode>:` set GPRS attach mode

0 automatic power-on attach

1 attach by request (when a PDP context is being activated)

`<detach_mode>:` set GPRS detach mode

0 detach when all PDP contexts are deactivated

1 detach when power-off

Information examples

1. AT%CGAATT=0,1 // set MS as power-on attach and store this setting into the file system.

2. AT%CGAATT=1,0 // set MS as no power-on attach.
3. AT%CGAATT? // Query current setting.

2.7.8 Flash Memory Check $FSCHK

Table: + FSCHK parameter command syntax

Command	Possible response(s)
$FSCHK=0	OK

Description

This command is used to perform software test on flash memory. And the input must be set as 0. The response will be OK if no software problem was found ,

otherwise it return an simple ERROR.

Example:

AT$FSCHK=0

OK

2.7.9 Play Tone on Loud Speaker $CLSL

Table: $CLSL parameter command syntax

Command	Possible response(s)
$CLSL=<isEnable>[,<volume>, <freq>,<duration>]	OK, ERROR.

Description :

This command allows a tone to be played on current loud speaker. Frequency, volume, and duration can be set.

Defined values :

<isEnable>

0: Stop playing.

1: Play a tone

<volume> (1-63)

This parameter sets the tone volume, The default value is 63.

<freq>(1-255)

This parameter sets tone frequency(in Hz) (mandatory if <isEnable>=1). The range is between 1*500Hz to 255*500Hz.

<duration> (100-5000):

This parameter sets the tone duration (unit of 100 ms).

When this parameter is 0 (default value), the duration is infinite, and the tone can be stopped by AT$CLSL=0.

Example:

AT$CLSL=1

OK

AT$CLSL=0

OK

©2004 BenQ Corporation. Confidential Property

2.7.10 Play Tone on Speaker $CSSL

Table: $CSSL parameter command syntax

Command	Possible response(s)
$CSSL=<isEnable>[,<gain>,<freq>,<duration>]	OK, ERROR.

Description :

This command allows a tone to be played on current speaker. Frequency, gain, and duration can be set.

Defined values :

<isEnable>

0: Stop playing.

1: Play a tone

<gain> (0-49)

This parameter sets the tone gain. The value means that –(0-49) db. The default value is 1.

<freq>(1-2000)

This parameter sets tone frequency(in Hz) (mandatory if <isEnable>=1). The range is between 1Hz to 2000Hz.

<duration> (100-5000):

This parameter sets the tone duration (unit of 100 ms).

When this parameter is 0 (default value), the duration is infinite, and the tone can be stopped by AT$CSSL=0.

Example:

AT$CSSL=1
OK

AT$CSSL=0
OK

2.7.11 Get PIN1, PIN2, PUK1, PUK2 remaining number %PVRF

Table: %PVRF parameter command syntax

Command	Possible response(s)
%PVRF	<remaining number>, Error.

Description :

This command will return the remaining number of PIN1, PIN2, PUK1, and PUK2.

Defined values :

The parameter must sets the '?'. That means we want to query a information.

Example:

AT%PVRF?

%PVRF=3,2,10,10

2.7.12 SIM Authentication $SIMAUTH

Table: $SIMAUTH parameter command syntax

Command	Possible response(s)
$SIMAUTH="RAND"	$SIMAUTH: "<SRES>","<KC>"

Description :

This command will calculate SRES and KC based on the given RAND.

Example:

AT$SIMAUTH="11111111111111111111111111abcdef"

$SIMAUTH: "CDEA40AB","006066D77D71F841"

OK

2.7.13 RTC DATE '$DATE'

Table: +DATE parameter command syntax

Command	Return
$DATE= <YY,MM,DD>	
$DATE?	$DATE: <Year>,<Month>,<Day>
$DATE=?	$DATE: YY/MM/DD

Description

This command is used to set the date in RTC.

Defined values

<YY>: The year minus 2000. For example, the Year 2003 is the YY= 03. It starts from 00 to 99.

<MM>: The month field. (1..12)

<DD>: The day field (1..31)

Example

AT$DATE?
$DATE: 03/01/01
OK

AT$DATE= 03,10,11
OK
AT$DATE?
$DATE 03/10/11
OK

AT$DATE= 03,13,33 // Out of range
ERROR

2.7.14 RTC Time '$TIME'

Table: +TIME parameter command syntax

Command	Return
$TIME= <HH,MM,SS>	
$TIME?	$TIME: <Hour>,<Minute>,<Second>
$TIME=?	$TIME: HH/MM/SS

Description

This command is used to set the time in RTC. It uses the 24-Hour format.

Defined values

<HH> : The hour field. (0..23)

<MM>: The minute field. (0..59)

<SS> : The second field (0.. 59)

©2004 BenQ Corporation. Confidential Property

Example

AT$TIME?
$TIME: 00/00/00
OK

AT$TIME= 01,10,11
OK
AT$TIME?
$TIME: 03/10/11
OK

AT$TIME= 25,01,33 // Out of range
ERROR

2.7.15 Green LED Setting $GLED

Table: $GLED parameter command syntax

Command	Return
+GLED=<mode>,<light_duration>,<dark_duration>	

Description

This command is used to set the duration of green led.

Defined values

<mode>:
1: turn on
0: turn off
<light_duration>:
Duration of green led to be light (ms) : 1 ~ 65535
<dark_duration>
Duration of green led to be dark (ms) : 1 ~ 65535

Informative examples

-Initial the HyperTerminal
-Initial the MS
-AT Command
AT$GLED=1, 100, 200<CR>

©2004 BenQ Corporation. Confidential Property

$GLED: 1

OK

©2004 BenQ Corporation. Confidential Property

2.8 M2M: Machine to Machine

The M2M AT command provides TCP/IP socket over GPRS connection. These AT commands are only available in the M2M firmware.

2.8.1 PCO string for context activation '%CGPCO'

Table: %CGPCO parameter command syntax

Command	Possible Response(s)
%CGPCO=[<format>],["PAP,<UserId>, <Passwd>"], [<cid>]	OK ERROR

Description

This command set the PCO for context activation.

Defined Values

< format >: 0 for HEX mode, 1 for ASCII mode.

< UserId >: a string that identifies user Id for PDP context.

< Passwd>: a string that identifies user password for PDP context.

< cid >: 1 for PDP data compression off, 2 for PDP data compression on

Other values are reserved and will result in an ERROR response to the set command.

Informative examples

-Initial the HyperTerminal

-Initial the MS

-AT Command

AT%CGPCO=1, "PAP, userid, password", 1<CR>

OK

2.8.2 TCP/IP Timeout for M2M packet '$TIMEOUT'

Table: $TIMEOUT parameter command syntax

Command	Possible Response(s)
$TIMEOUT=[<timeout>]	OK ERROR

Description

This command set the timeout for M2M (machine to machine). If UART does not send TCP data for the timeout period, the module will send the buffered data in one packet.

Note: This command is only available in M2M firmware.

Defined Values

< timeout >: 100—5000 (in mSecond).

Other values are reserved and will result in an ERROR response to the set command.

Informative examples

-Initial the HyperTerminal

-Initial the MS

-AT Command

AT$TIMEOUT=2000<CR>

OK

2.8.3 TCP/IP Remote destination Server information '$DESTINFO'

Table: $DESTINFO parameter command syntax

Command	Possible Response(s)
$DESTINFO=[<ip_address>],[<protocol>],[<port>]	OK ERROR

Description

This command set the remote server information for M2M (machine to machine).

Note: This command is only available in M2M firmware.

Defined Values

< ip_address >: IP Address of destination server

<protocol>: 1 for TCP, 2 for UDP

<port>: TCP/UDP port number, 1-65535

Other values are reserved and will result in an ERROR response to the set

command.

Informative examples

-Initial the HyperTerminal

-Initial the MS

-AT Command

AT$DESTINFO=”168.95.100.100”, 1, 23<CR>

OK

2.9 Error Message

2.9.1 Mobile Equipment error result code +CME ERROR: <unsolicited><p>

Table: +CME ERROR parameter Syntax

Command	Possible response(s)
	Wrong: +CME ERROR: <err>

Description

The operation of +CME ERROR:<err> result code is similar to the regular ERROR result code: if +CME ERROR:<err> is the result code for any of the commands in a command line, none of the following commands in the same command line is executed.(neither ERROR nor OK result code shall be returned as a result of a completed command line execution). The format of <err> can be either numeric or verbose. This is set with command +CMEE.

Defined value

<Err>:

0	Phone failure
1	No connection to phone
2	phone-adaptor link reserved
3	Operation not allowed
4	Operation not supported
5	PH-SIM PIN required
6	PH-FSIM PIN required
7	PH-FSIM PUK required
10	SIM not inserted
11	SIM PIN required
12	SIM PUK required
13	SIM failure
14	SIM busy
15	SIM wrong
16	Incorrect password
17	SIM PIN2 required
18	SIM PUK2 required
20	Memory full

©2004 BenQ Corporation. Confidential Property

21	Invalid index
22	Not found
23	Memory failure
24	Text string too long
25	Invalid characters in text string
26	Dial string too long
27	Invalid characters in dial string
30	No network service
31	Network timeout
32	Network not allowed – emergency calls only
33	Network busy
34	Network operation failed
35	Network incorrect password
36	PLMN no service
37	Hardware failure
38	ACM Max exceeded
39	FDN not matched
40	Network personalization PIN required
41	Network personalization PUK required
42	Network subset personalization PIN required
43	Network subset personalization PUK required
44	Service provider personalization PIN required
45	Service provider personalization PUK required
46	Corporate personalization PIN required
47	Corporate personalization PUK required
51	Voice memo memory problem
52	Voice dial training fail
53	Voice dial need more sample
54	Voice dial similar sample exist
55	Voice dial recognize fail
56	Voice erase not finished
57	Voice erase finished
58	Voice erase restart
100	Unknown
103	illegal MS
106	illegal ME
107	GPRS service not allowed
111	PLMN not allowed
112	Location not allowed

©2004 BenQ Corporation. Confidential Property

113	Roaming not allowed in Location Area
132	GPRS service option not supported
133	requested service option not subscribed
134	service option temporarily out of order
148	unspecified GPRS error
150	invalid module class
512	fail to abort
513	ACM reset needed

2.9.2 Message Service Failure Result Code +CMS ERROR: <unsolicited><p>

Table: +CME ERROR parameter Syntax

Command	Possible response(s)
	Wrong:+CMS ERROR: <err>

Description

Final result code +CMS ERROR: <err> indicates an error related to mobile equipment or network. The operation is similar to ERROR result code. None of the following commands in the same command line is executed. Neither ERROR nor OK result code shall be returned. ERROR is returned normally when error is related to syntax or invalid parameters.

Defined Values

0…127	GSM 04.11, annex E-2 values
1	Unassigned number
8	Operator determined barring
10	Call barred
21	Short message transfer rejected
27	Destination out of service
28	Unidentified subscriber
29	Facility rejected
30	Unknown subscriber
38	Network out of order
41	Temporary failure
42	Congestion
47	Resources unavailable unspecified
50	Requested facility not subscribed

©2004 BenQ Corporation. Confidential Property

69	Requested facility not implemented
81	Invalid short message transfer reference value
95	Invalid message unspecified
96	Invalid mandatory information
97	Message type non existent or non implemented
98	Message not compatible with short message protocol state
99	Information element non existent or not implemented
111	Protocol error unspecified
127	Interworking unspecified
128…255	TP Failure-Cause(TP-FCS) values according to GSN 03.40
128	Telematic interworking not supported
129	Short message type 0 not supported
130	Cannot replace short message
143	Unspecified TP-PID error
144	Data coding scheme not supported
145	Message class not supported
159	Unspecified TP-DCS error
160	Command cannot be actioned
161	Command unsupported
175	Unspecified TP command error; either the message type identifier is other than SMS command, or the service center address is corrupt
176	TPDU not supported
192	SC busy
193	No SC subscription
194	SC system failure
195	Invalid SME address
196	Destination SME barred
208	SIM SMS storage full
209	No SMS storage capability exceeded
210	Error in MS
211	Memory capacity exceeded
255	Unspecified error cause
300	ME failure
301	SMS service of ME reserved; the phone is busy sending a message
302	Operation not allowed
303	Operation not supported
304	Invalid PDU mode parameter

©2004 BenQ Corporation. Confidential Property

305	Invalid text mode parameter
310	SIM not inserted
311	SIM PIN necessary
312	SIM PIN necessary for PH-SM
313	SIM failure
314	SIM busy
315	SIM wrong
316	SIM PUK required
317	SIM PIN2 required
318	SIM PUK2 required
320	Memory failure; write of SMS to specified memory failed
321	Invalid memory index
322	Memory full
330	SMSC address unknown
331	No network service
332	Network timeout
500	Unknown error
…511	Other values within the range from 256 to 511 are reserved
512	No support character set
513	No support character transfer
514	Protocol stack error
515	SIM not ready
520	CB set too many types
521	CB set too many languages
522	CB set too many types and languages